DPTI:scapreps

From: Paul and Barbara Zed <paulbarb.zed@gmail.com>
Sent: Wednesday, 27 June 2018 1:23 PM
To: DPTI:scapreps
Subject: Representation re 354/V003/18
Attachments: Representation on Application..pdf; Submission V2.docx

To The Secretary
State Commission Assessment Panel,

Please find attached a Representation and submission opposing part of Neoen's proposal for the development of a Crystal Brook Energy Park.
The proposed location of the wind farm comprising of 26 turbines up to 240m high, each with an output of up to 4.8MW is far too close to Crystal Brook, Beetaloo Valley and Bowman Park.
Thankyou in anticipation of your consideration of, and action in relation to this submission.
Your Sincerely,
rbara Zed
19 Darbon Terrace, Crystal Brook SA 5523

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DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	Friday 29 June 2018
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: Barbara Zerk

My phone number: 0400499446

PRIMARY METHOD(s) OF CONTACT: Email address: paulbarb.zerk@gmail.com

Postal address: 19 Dalton Terrace

Crystal Brook SA. Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [✓] a private citizen

The address of the property affected is 19 Dalton Tce Crystal Brook Postcode 5523

The specific aspects of the application to which I make comment on are: .....

Please see Submission V2

emailed with this application

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 27/6/2018 Signature: B L Zerk

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

CROWN DEVELOPMENT APPLICATION 354/V003/18 – NEOEN AUSTRALIA PTY LTD

I am a resident of Darbon Terrace, Crystal Brook and have serious concerns regarding Neoen's Application to build a windfarm of twenty-six towers, up to two hundred and forty metres in height, in close proximity to residents and the township of Crystal Brook.

I am a strong supporter of renewable energy, but I cannot support the windfarm component of Neoen's application proposing that 26 wind turbines of 240 metres height be situated so close to Crystal Brook, Beetaloo Valley and Bowman Park in the Southern Flinders Ranges.

Pam Pilkington of Talbot Road, Crystal Brook has documented some of the many valid issues that need addressing before the proposed windfarm goes ahead.

I request that the State Commission Assessment Panel consider the following issues outlined by Pam Pilkington in their assessment of Neoen's application:

1. VALIDITY OF APPLICATION.

Part 1, Appendix D, includes a letter from Don Russell, Chief Executive Department of Premier and Cabinet, which states:

"With a three-month extension, a development application under this Crown sponsorship variation must now be lodged with the State Planning Commission on or prior to 31 March 2018. If this is not achieved by that time, my support under Section 49(2)(c) of the Development Act 1993 for Neoen's Crystal Brook Energy Park will lapse."

The SA Public Register Summary for Development Number 354/V003/18, printed from the SA Planning Portal website on 31/05/2018, shows that the lodged date was 05/04/2018. When a Crystal Brook resident sought confirmation of the lodgement date via a phone call to Lee Webb, Contact Officer for the State Commission Assessment Panel on 13/6/2018, she was assured that the date lodged was 05/04/2018 as that was when the payment and papers were received. Subsequently, however, this date on the SA Planning Portal was changed on 15/06/2018 to read 29/03/2018. I question the reasoning for this change? Furthermore, I received a letter from the Hon Stephan Knoll, Member for Schubert and Minister for Transport, Infrastructure and Local Government, and Minister for Planning, which was dated 11 May 2018. In the second paragraph, he states,
"I can confirm that a development application for this project was lodged with the State Commission Assessment Panel (SCAP) on 5 April 2018".

The application did not meet the timeline requirements for Crown Sponsorship support under Section 49(2) (c) of the Development Act 1993, which raises the question, "Is it a valid application?"

2. CONFLICT OF INTEREST

Code of Ethics for South Australian Public Sector – "Public sector employees will avoid actual or potential conflicts of interest"

There is a Conflict of Interest. The Presiding member for the State Commission Assessment Panel is also a Principal Planner for GHD, the company engaged by Neoen to provide the following reports in their application:

- Volume 1 – Project Description and Impact Assessment Findings
- Draft Construction Environmental Management Plan
- Volume 2 - Project Description and Impact Assessment Findings
- Traffic Impact Assessment Report
- Electromagnetic Interference Assessment

A further Conflict of Interest exists with another member of SCAP who is the Honorary French Consul for South Australia. Neoen is a French company.

Without a Conflict of Interest being declared by both parties, and the Presiding Member taking no part in the discussion and decision-making procedures, I cannot have confidence in the integrity of the assessment process.

3. UNPROFESSIONAL APPLICATION

Of great concern is the poor quality and substandard presentation of Neoen's application. It is apparent that it has been prepared using 'cut and paste' from earlier versions which are not relevant to this project, contains references not applicable, and there are numerous errors in formatting and anomalies in facts, demonstrating inadequate proof-reading and checking for accuracy.

The application contains numerous anomalies, some examples of which are listed below:

1. *Volume 1, Page 1-SCAP Application on Notification – Crown Development, -Zone/Policy Area is listed as Primary Production Zone Port Pirie Regional Council*, **however, Turbine CB 18 is situated in the Port Pirie Regional Council <u>Landscape Protection Zone.</u>**
2. *Volume 1 p3- "The redesign of the project also took into account concerns expressed by the Beetaloo Valley Association, with the result being that no BVA dwelling is any closer than 2.9km to a turbine, with the majority at a distance well over 5km."* **That statement is not correct**. The closest Beetaloo Valley residence is only 1.3kms away.
3. *Volume 1, p 17 Table 3.1– Wind -'Extending along the ranges south and **north** of Wilkins Highway* – inconsistent with other tables and maps indicating no turbines are north of Wilkins Highway. Property Certificate of Titles are not consistent throughout the application. CT5516/886 and CT6187/686 are in Northern Areas Council.
4. *Volume 1, p 32, 4.2- "The portion of the site covered by the Port Pirie Development Plan is within the 'Primary Production Zone'. The boundary of the Primary Production Zone follows the alignment of the gas pipeline which means that the whole of the project is location(sic) within this zone".* **This is not correct.** The Primary Production Zone follows the water pipeline not the gas pipeline, which means that Turbine CB18 is in the <u>Landscape Protection Zone</u>.

5. Volume 2, GHD's Traffic Impact Assessment Report(TIAR), is very poorly presented with numerous formatting errors, incorrect information, references and data, and photographs from previous projects. I found three occurrences of directions of photographs being incorrect (e.g. looking East when it should have read West), Table 10 with no data in it, at least sixteen occurrences of *"in Error! Reference source not found."*, seven randomly inserted occurrences of *"Figure 17 Principal Heavy Vehicle OMD Routes providing access to the proposed site, from east of the Victorian/South Australian Border"*, and 2 randomly inserted occurrences of *"Table 16 Level of Service (LoS) vs AADT for two lane, two way rural roads, assuming rolling terrain and K=0.10 (Austroads GTEP part 2, table 3.9,1999".*
6. The Traffic Impact Assessment Report 5, states *"The most up to date provisional Crystal Brook Energy Park layout comprises of **29** wind turbines as shown in Error! Reference source not found.**3**".* Maps in Figure 3 on page 5, and Appendix A map on page 59, are from a previous version with **28** turbines in different locations to the final plan which only has **26**.
7. All GHD map layouts throughout the application are shown as "Draft".
8. Volume 2, last page has not been signed by GHD or even listed the author(s) to verify ownership of the document.

These basic errors are inexcusable. Page 2 of the Transport Impact Report states *"GHD Pty Ltd has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared."* **This does not absolve Neoen's responsibility to ensure that the reports submitted in the application were updated to the final version of the proposal**.

4. TURBINE SIZE AND CAPACITY

It is a telling sign that two of the major host benefactors of the turbines, will not be residing in proximity of the windfarm, yet the population of the Crystal Brook township and neighbouring residents will endure the legacy for decades to come. These turbines will be the largest in Australia, and the second largest on-shore turbines in the world. Neoen's proposal is for turbines up to 240 metres high with a capacity of 4.8MW, compounded by very densely clustered positioning. The accumulative effect has not been tested and is unknown. None of the planning assessment, compliance guidelines or safeguards for nearby residents and land uses have been updated to correlate with these substantial increases, almost doubling in size and capacity, and there are no precedents to assess the issues. The 'goal posts' have been significantly shifted by Neoen, with no accompanying 'catch-up' with compliance and monitoring regulations. **I urge the SCAP to place a moratorium on this and further windfarm developments until appropriate and rigorous independent testing can be carried out.**

5. COMMUNITY AND STAKEHOLDER ENGAGEMENT

In Part 1, 1.3 Neoen state
"In February 2017, once agreements had been finalised with the majority of involved landowners, the engagement process extended to neighbours within 3km of the project boundary and a range of other relevant stakeholders."

In June 2017, over 600 people signed a petition against the windfarm proposed at that time, and that petition was presented to the local Member, the Hon Geoff Brock, who at the time, had the cabinet positions of Minister for Regional Development and Minister for State and Government Local Relations. That proposal was later paused and redesigned in an attempt to locate the turbines to meet with Port Pirie Regional council's Primary Production Zone. As previously stated, one turbine is still located in the Landscape Protection Zone.

There was no direct consultation from Neoen with nearby residents when the latest proposal of 26 turbines at 240 metres in height was presented. The only community consultation was held in the Crystal Brook CWA clubrooms on March 26th for four hours. In conversations with locals in recent weeks, it is very apparent that many people, including business owners, have little or no knowledge of the project, have no idea how close to the town the turbines will be, have no concept of the immense height of them or how closely clustered together they are, and no knowledge of the impact they will have on television reception and wireless broadband signals.

In Volume 1, GHD report page 46, Neoen state: "Potential minor service degradation to local community, i.e. TV reception within 10 km of wind farm may be affected."

The furthest extremity of the township of Crystal Book is within 5.5km of the nearest turbine and 8.6 kms of all 26 turbines. The impact on residents' television reception will be significant having that many turbines so close.
Many people have commented about the turbines they can see at Clements Gap windfarm west of Crystal Brook, which has the closest turbine 15.6kms from the main street of Crystal Brook and turbines half the height of Neoen's. They have said that it doesn't bother them, and they don't foresee an issue with the proposed project, until they are informed of the scale and close proximity of this proposal and made aware of Neoen's documented impacts. Then they become alarmed and incensed.

Clearly, Neoen's community consultation process has been inadequate and ineffective.

6. IMPACTS

FLORA AND FAUNA

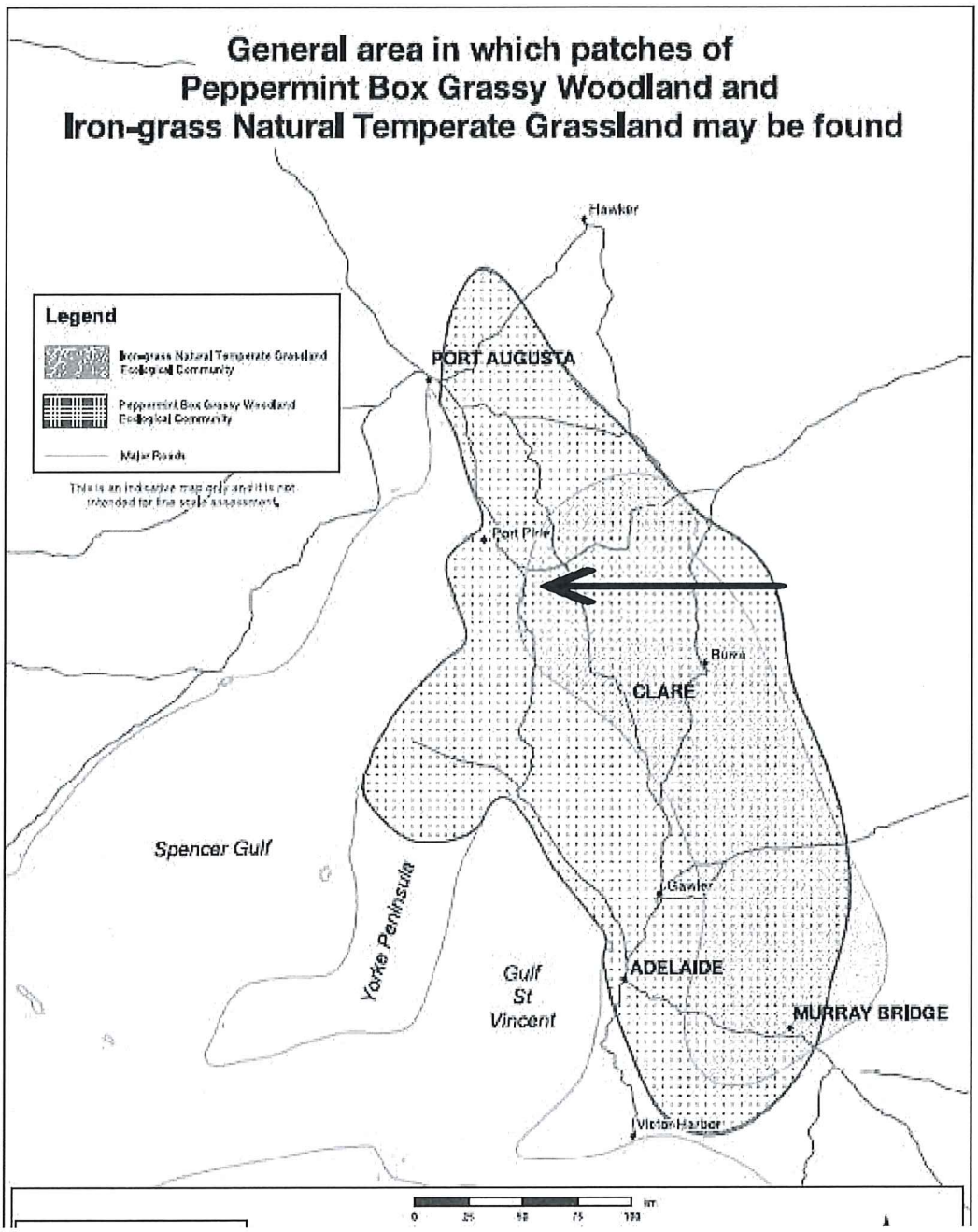
- *Volume 2, Executive Summary page iii "The flora and fauna field survey for the Crystal Brook site was undertaken from the 27th February to the 2nd of March 2017 with follow up surveys undertaken in May 2017 and February 2018".*- Flora surveys are most accurate when taken in Spring when the majority of plants are in flower, and most noticeable. The surveys conducted for Neoen's report were mostly done during the hottest and driest months of the year when annuals such as lilies and daisies have died off, and herbs, forbs and shrubs are dormant or not flowering, consequently giving an inaccurate account of the range and diversity of native species present. None of the flora surveys were conducted in Spring.
- Northern and Yorke Natural Resources Strategic Plan –Aspirational Target - Healthy Terrestrial Ecosystems – Resource Condition Target B1. Viable Vegetation Communities -*By*

2030, maintain the condition of the region's 1,200,000 ha of remnant native vegetation, and improve the condition of 15% from 2008 levels.

- The disturbance to the natural habitat in this proposed concentrated area, approximately 3.2kms by 3.5kms, will be extensive, accommodating 26 access tracks and underground cabling, 26 concrete foundations, 26 crane hardstand areas and additional temporary laydown areas at each site for parts.
- **This contravenes the N&Y NRM Strategic Plan Aspirational Target and Resource Condition Target to improve the condition of 15% of remnant native vegetation from 2008 levels.**

- Northern and Yorke Natural Resources Strategic Plan –Aspirational Target - Healthy Terrestrial Ecosystems – Resource Condition Target B3. Increased Connectivity – *By 2030, there is an increase in ecological connectivity with and between landscapes from 2008.*
  - Crystal Brook Energy Park Windfarm is located in the Southern Flinders Ranges and dissects the Southern Ranges directly between Bowman Park and Hughes Gap which will impact substantially on the connectivity of flora and fauna between the two landscapes. Birds SA list 64 species recorded to date at Bowman Park, including the Endangered Diamond Firetail. Reference: https://birdssa.asn.au/location/bowman-park-crystal-brook/
  - Lace Monitors and Echidnas are commonly sighted at and near Bowman Park. Three Lace monitors were spotted on one day when our family was there.
  - Connectivity of landscapes which support the flora and fauna of Bowman Park will be disrupted with 26 turbines and associated infrastructure built in the path. Crystal Brook creek runs through the centre of the proposed site, and contains a natural spring at Bowman Park, a crucial water supply for birds and wildlife.
  - **This contravenes the N&Y NRM Strategic Plan Aspirational Target and Resource Condition Target to increase in ecological connectivity with and between landscapes from 2008.**
  - Of great concern is the cumulative effect on biodiversity. Almost every north-south range traversing from Spencer Gulf towards the River Murray plains in the East, is littered with wind turbines clustered along them. What monitoring is being carried out on a landscape scale to determine the long-term cumulative effects on our flora and fauna? When the wedge-tailed eagle has very little natural habitat left to survive, it's too late.
- The Environment Protection and Biodiversity Conservation (EPBC) Act Policy Statement 3.7 describes Nationally Threatened Species and Ecological Communities which covers Peppermint Box (Eucalyptus odorata) Grassy Woodland of South Australia and Iron-grass Natural Temperate Grassland of South Australia. As can be seen in the map below (EPBC Map), **both** plant communities exist in the windfarm area.

EPBC Map – black arrow indicates both threatened vegetation communities at the proposed windfarm site



Volume 1, page 48, GHD report states-"The flora and fauna survey undertaken identified a number of constraints relating to vulnerable species within project (sic) area. In particular: (et.al) An intact vegetation community, Eucalyptus odorata."
Volume 2, page 48, EBS ecology report states-"The Mallee vegetation on the eastern side of the Mercowie Creek was intact and in moderate condition with substantial understorey species diversity despite evidence of ongoing grazing. While this area was not surveyed extensively, this area is considered to be of high conservation value due to the likelihood of annual and ephemeral threatened species being present as well as being a substantial intact patch to which any fragmentation would reduce local biodiversity values through increased edge effects, disruption of animal movement pathways and potential changes in hydrology."

By EBS Ecology's own admission, they did not survey the area extensively, and the surveys were carried out at inappropriate times of the year, namely, not in Spring, therefore their findings are not conclusive. What other endangered species are in the windfarm zone, which aren't published? These critical environments must be protected. Observations by residents living close to a nearby windfarm built by Neoen, is that once construction begins, workers have little or no regard for the natural habitat and landscape. Once the landscape has been devastated, it's too late. What independent monitoring will take place to oversee that this does not happen?

7. TOURISM

Crystal Brook has traditionally been known as the place "Where the Flinders Begin". Bowman Park is a tranquil, picturesque, recreational facility for day visitors, and in recent years, for RV campers who are permitted to stay for forty-eight hours.

A small group of volunteers formed a management committee in 2009 to restore the park to a safe, family friendly environment, after several years of no management and being wrecked with vandalism. The volunteers have worked tirelessly, to return the park to its natural beauty and now has many visitors and campers from Australia wide on a daily basis and even overseas. The peace, tranquillity and natural beauty, birdlife and wildlife are commented on frequently by visitors, and comments made on the campers "WikiCamps" website, is testament to their appreciation of the volunteers' efforts and their enjoyment while visiting the park.

Six wind turbines are planned within a 2 kilometre radius of Bowman Park campground, and all 26 turbines are less than 5 kilometres. There are walking trails to the ridges on both the east and west flanks of Bowman Park, with magnificent views of the Flinders Ranges to the north. These ranges (pictured) are where 26 turbines will be situated near Bowman Park. The visual amenity for visitors will be devastating.

The campground is in a gully and therefore sheltered, so when it's calm at the campground, but breezy at elevations of 300 plus metres above, campers will be subjected to the cumulative noise and infrasound effects of up to 26 turbines. Visitor numbers and the associated spin-off benefits to the local businesses and community, will be significantly impacted.
The access road to Bowman Park turns-off from an elevated section of Huddleston Road. Bowman Park road descends down to the entrance for 1.5kms heading to the north, and from the turn-off, the visual impact of all 26 turbines immediately behind the park, will look like an industrial eye-sore, all the way down to the park entrance.
The Heysen trail follows the creek line right through the centre of the project area. Walkers trekking from the north will be subjected to the sight of all turbines for many kilometres from The Bluff near Port Pirie, south to the windfarm.
No photomontages were provided by Neoen from the Huddleston Road turn-off to Bowman Park, to depict the view that tourists would encounter as they drive down to the entrance.

8. *TRAFFIC IMPACT*

Much of the information reported relates to previous proposals. There are numerous anomalies regarding the dimensions of components being transported, with little or no information on the actual turbine components which are proposed in the final plan. The length of OD vehicles will need to be increased to accommodate the longer blades and hubs, which in turn will require further assessments for clearances, bridge limits, climb grades and turning movements. Larger cranes will need to be transported to the sites, to accommodate the much larger towers.

Volume 2, Traffic Impact Assessment Report, p 47states, "*With blades of up to 55 m long, the semi-trailer will likely be approximately 68 m long*". **The proposed blades will be 79 m long** (Volume 2, Landscape and Visual Impact Assessment, page 7), **so how long will the OD vehicles need to be to carry these, and what other consequences will that raise?**

Site Access

*Volume 2, TIAR, page 36 states, "**A primary road safety concern during construction is vehicle sight distance at key intersections and the site access point. Delivery vehicles will often be slow moving and take time to clear the carriageway, hence it is critical that approaching vehicles have enough time to reduce speed and avoid collision."***

*"The sight distance to both the eastern and western approach meets Austroads requirements for passenger vehicles. **However, sight distance to the eastern approach fails to meets (sic) requirements for heavy vehicles, raising a substantial safety concern**."*

"Preliminary measurement at the likely site access point for Crystal Brook South Wind Farm shows sight distance from the intersection would be in excess of 400 m, exceeding Austroads requirements for both heavy vehicles and passenger vehicles."

These statements raise several serious concerns for me regarding safety to other road users.

- Although the report does not specify where the access point will be, Figures 26 and 27 on page 37 and 38, illustrate where the proposed access point is (taking into account that Figure 26 states it looking "west" when in fact it is east, and Figure 27 states that it is looking "east", when it is actually looking west)

- If this is the access point, it is truly alarming for the following reasons:
  - It is located at the **crest** of a hill (western ridge of Hughes Gap), with limited vision either side of the crest.
  - It is a road-train route.
  - It is a school bus route.
  - It is a grain freight route used throughout the year for moving grain from the Gladstone GrainFlow site to the port at Wallaroo, and more importantly is a major route for grain farmers and contractors throughout the Upper North grain producing region for transporting semi-trailer and road train loads of grain during the very busy harvest season.

Regular transport users of Wilkins Highway will be greatly inconvenienced and placed in significant danger if they are required to suddenly stop on the top of the hill at the access point for the wind farm components, indicated in Figures 27 and 28.

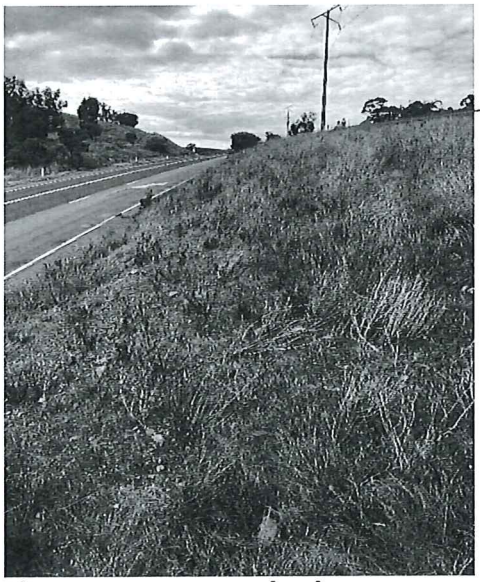
The safety of, and inconvenience to, other road users should be of paramount consideration and an absolute priority, when planning where the windfarm components will be transported, major intersections used and access points to private property .

Volume 1, p20 –"The main access tracks will provide access to the WTG sites and will be developed to take the weight of WTG transport and construction vehicles and the cranes used to erect the turbines. These will be located in consultation with landowners and the ecology advisors to ensure a balance between farming operations and protection of native vegetation."

This has not happened at Hornsdale windfarm, where landholders' access track location requests have been ignored. Neoen has carved roads where it suits them, dissecting paddocks, causing distress to landholders and disruption to their farming operations and precision agricultural practices.

My opinion is that the SCAP should regard GHD's Traffic Impact Assessment Report as being flawed, incorrect and unsuitable to assess this proposal.

Windfarm access point



Windfarm access point

Looking east towards the crest on the righthand side road verge

9. VISUAL IMPACT

Volume 2, landscape and Visual Impact Assessment(LVIA) Page 92 states "This LVIA identified 14 non-host residential dwellings within 3km of the wind turbines and determined that the majority of these would not experience a significant (high) visual effect as a result of the Project."

"Proposed mitigation works, including landscape screening, is considered likely to mitigate views toward the majority of the Projects principal assets."

"Overall this LVIA concludes that the Project would not have an unreasonable impact on the landscape character, or the visual amenity of people living, working, or travelling through the landscape surrounding the Project Site."

I strongly dispute their conclusions. Our home is 3kms from the two closest turbines. The proposed towers will stand approximately thirty-two metres taller than the Nyrstar Stack in Port Pirie. People familiar with this district will readily appreciate that they will be very imposing structures, when they imagine 26 towers, taller than the Pirie Stack, placed clustered together along the Southern Flinders Range. The visual impact will be substantial, from any aspect. I am amused that Neoen were offering at their Information Session, to supply vegetation to screen the turbines from view, and sadly, some people were appreciative of their offer. It will take years for their trees to grow to a sufficient height to providing a screening effect. As soon as one takes a step either side of the vegetation, the turbines will still be in view. Neoen also claim that several locations will be partially or fully screened from the turbines, so the visual effect will be reduced. It's very difficult to screen a structure that's 240 metres high, on top of a ridgeline.
Every morning when I open my bedroom curtains, I will be viewing 26 turbines from the window – (refer to Volume 2, Green Bean Design Report page 82, Photomontage P1. Figure 26, Talbots Road), which was taken just to the east of our home.
I enjoy the natural beauty of the skyline just as it is. I love working in my garden with the picturesque ranges as a backdrop. I do not want it destroyed with these enormous structures.

10. NOISE AND INFRA SOUND

Another great concern for me is the impact of noise and infrasound and potential health impacts of those of us living nearby. These are the first turbines to be built in Australia of this magnitude and output. Guidelines currently in place do not consider these structures, and testing has not been carried out to assess the long-term ramifications for continuous exposure to the output of these turbines. There are no precedents in Australia. Until comprehensive investigations are undertaken, and outcomes assessed, then approvals for, and installation of these structures should cease.

11. DEVALUATION OF RURAL LIVING PROPERTY VALUES

This proposed project is situated nearby to many Rural Living properties, near Crystal Creek Estate in the north eastern edge of Crystal Brook, Bowman Street Extension, Goulter Road, Beetaloo Valley, and other nearby locations.
It has been argued in previous studies that there are no reductions in land values near windfarms, and in fact in some instances, property values have risen. That could truly be the case, when

considering that most windfarms are in rural settings, away from townships, and many property owners are hosts, receiving significant financial rewards for accommodating the turbines. These "cashed-up" landholders are in the advantageous position of having cash reserves readily available to outbid non-associated neighbouring landowners when parcels of land become up for sale, thus driving up and inflating land values.

However, in this instance, there are very many non-associated properties nearby, which have developed because of their natural appeal, tranquillity, beautiful views and open spaces. Many young families have built their dream homes in their dream location. With 26 turbines overbearing their properties, and detracting for the appeal they were established for, their properties will accordingly devalue, because no one will want to buy them and live there. There is already evidence in other states where this has happened when windfarms have been located close to communities.

CONCLUSION

As indicated, many issues have been listed in which this proposal will negatively impact our local community of Crystal Brook, on tourism and the compounded effect on local businesses, on the threats to our valued and endangered biodiversity, our safety on the roads during construction phase due to the slow moving over-dimension vehicles manoeuvring road junctions and onto private properties, the effect of loss of visual amenity and noise and infrasound impacting our quality of life, and finally, the devaluation of our life's savings invested in our homes.
At what cost to humanity do we blindly continue to pursue the rush into wind energy, without considering emerging technologies and a holistic plan for our future energy supplies.

'THE STRUGGLE FOR POWER'

"The first decade of Australia's renewable energy scramble can be likened to a modern-day gold rush.

Scouts of prospectors swarmed potential sites for wind farms with little regard for the impact they would have on unwary rural communities or the electricity system as a whole. The hills from South Australia to Queensland are littered with tales of sharp practices where neighbours were pitted against neighbours to sign up wind-farm development sites.

Often leading the charge were small companies that sold the sites and development approvals to bigger organisations with the deep pockets needed to build.

A report by the National Wind Farm Commissioner acknowledges the history of community division, unfair contracts, inadequate communication, potential conflicts of interest and disregard for complaints of human suffering. The Wind Farm Commissioner set out a road map for how the industry could clean up its act. And the renewables industry insists that lessons have been learned.
But the legacy of initial haste bears all the hallmarks of any gold rush from yesteryear."

Research and Documentation: Pam Pilkington, 15 Talbots Road,
CRYSTAL BROOK SA 5523 pam@pcc.farm
Fully supported by: BARBARA ZED, 19 Darbon Terrace CRYSTAL BROOK SA 5523
paulbarb.zed@gmail.com

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DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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My name: SUE REDFORD

My phone number: 0487 364 787

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 20 HOPKINS ST

PT PIRIE Postcode 5540

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [✓] a private citizen

The address of the property affected is 451 Hughes Gap Road Postcode 5523

The specific aspects of the application to which I make comment on are:

The windfarms are a blight on the beautiful countryside and if I lived on a farm I wouldn't want to see them on the horizon when I went outside. Put them way way away from farms if you have to have them

I
- [ ] ~~wish to be heard in support of my submission~~
- [✓] do not ~~wish to~~ be heard in support of my submission

(Please ~~tick~~ one)

by
- [ ] appearing personally
- [✓] being represented by the following person : MARK CUNNINGHAM

(Cross out whichever does not apply)

Date: 23-6-18 Signature: S Redford

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

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Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: ROGER KING

My phone number: 0417 827 083

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 20 HOPKINS ST

PORT PIRIE Postcode 5540

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:

[ ] owner of local property
[ ] occupier of local property
[ ] a representative of a company/other organisation affected by the proposal
[X] a private citizen

The address of the property affected is ..... Postcode.....

The specific aspects of the application to which I make comment on are: I DISAGREE WITH ANY STRUCTURES IN THE FLINDERS RANGES THAT DETRACT FROM THE NATURAL BEAUTY OF THE RANGES. THE EYESORES OF THE OTHER WIND FARMS (AS MUCH AS MAY BE NEEDED) DETRACTS FROM THE BEAUTY OF THE COUNTRYSIDE.

I
[ ] ~~wish to be heard in support of my~~ submission
[X] ~~do not wish to be heard in support of my sub~~mission
(Please tick one)

by
[ ] ~~appearing personally~~
[X] being represented by the following person : MARK CUNNINGHAM
(Cross out whichever does not apply)

Date: 23/6/2018 Signature: R King

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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My name: PETER CUNNINGHAM

My phone number: 0419 219 300

PRIMARY METHOD(s) OF CONTACT: Email address: pj.cunningham007@gmail.com

Postal address: 21 KEANE ST

PORT PIRIE Postcode 5540

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [Y] a private citizen

The address of the property affected is 451 Hughes Gap Road Postcode.....

The specific aspects of the application to which I make comment on are: The size of the proposed turbines being almost double the size of existing turbines used at other locations is of concern for the noise, vibration, and wind disturbance that will impact on the health and quality of life of the nearby residents and wildlife.

I
- [ ] wish to be heard in support of my submission
- [Y] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [Y] being represented by the following person : Mark Cunningham

(Cross out whichever does not apply)

Date: ..... Signature: PJ Cunningham

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DUPLICATE WITH 95

164

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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My name: Mark Cunningham

My phone number: 0419846772

PRIMARY METHOD(s) OF CONTACT: Email address: markjc1977@gmail.com

Postal address: PO Box 196 Crystal Brook

Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 451 Hughes Gap Road Postcode 5523

The specific aspects of the application to which I make comment on are: Please see attached.

I
- [✓] wish to be heard in support of my submission
- [ ] ~~do not wish to be heard in support of my submission~~

(Please tick one)

by
- [✓] appearing personally
- [ ] ~~being represented by the following person:~~ .....

(Cross out whichever does not apply)

Date: 26.6.18 Signature: Mark Cunningham

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

My objections to the wind farm component of the Crystal Brook Energy Park.

Size and condensed locations of turbines. Proximity to residents, Bowman Park, which is a tourist destination and the town centre. Current guidelines on such developments are outdated and refer to much smaller structures and need to be reviewed urgently. As an example of such, it is stated by the manufacturer of the turbines to be used, that it is recommended that the structures should be placed no closer than ten blade lengths apart. The distances of the turbines in Neoen's application draft are on average three blade lengths apart. This has the possibility to cause much turbulence and sound magnification and therefore breaching maximum allowed noise levels.

Impact on nearby residents and wildlife. Neoen's application omits many species that inhabit the area and downplays the effect of noise, ground vibration and air turbulence on such species. The disruption on the ecosystem will be significant for animals as well as the residents. I would also like to bring attention to the situation of my neighbour who rents a house owned by one of the hosts. This man, who I have known for 20 years, suffers from acute anxiety and depression and is currently on a disability pension. He has stated to me that he will have to vacate the house so it can be removed, as it is located within the minimum buffer zone for the turbines. This man has very little support and has a very uncertain future should this project go ahead. He has been offered no alternative living arrangements. It is most concerning how this man has been treated by the host and Neoen. It's as if his future and well being is of no real importance.

Interference of local television and Wi-Fi signals. This has the great potential of negatively affecting the running and performance of small business operators (of which I am one) as well as the many school students that need reliable internet for their studies and education. As a father of two, this is most concerning. The area affected by such interference falls within a 10 kilometre radius of the turbines. This includes all of Crystal Brook and Beetaloo Valley.

Devaluation of all nearby properties. Real estate companies across Australia have reported a significant drop in value and sales interest in properties situated near such developments. This has a potentially devastating effect on the futures of all who live there.

Neoen's hasty and erroneous application. It contains many omissions of details and incorrect information. There appears to be much cut and pasting from older applications and reporting not specific to the local area. The company has also been evasive and not forth coming in regards to the sound monitoring data they have collected. It seems they selected mostly host properties to conduct such research while rejecting others simply on the basis of denying the data to be freely available to such properties. Neoen also state that there is much support for the project even though a petition requesting 3 kilometre buffer zones between turbines and residents, gathered approximately 800 signatures in less than a month, was tabled in Parliament in July 2017 by the local minister Geoff Brock. This seems to be conveniently ignored.

Finally, I would like to add my own personal experience. I live on the property that is situated closest to the proposed site, just two kilometres north of Crystal Brook. In April 2017 I demolished the old house that we had been living in since February 2012 as it was becoming too dilapidated to renovate. By the middle of April, I had signed a contract with a local house builder to construct a new dwelling that was to be my family's long term home. At this time, I had not been contacted by Neoen to be informed of their planned development for the area even though most surrounding residents had been notified in February or earlier. Had I been notified at that time, as it was required by the company to do so, I would never have signed up to the building of a new house and thus spent 22 years of my life's savings to do so. I only became aware of the planned development by a Beetaloo resident at the end of April. I am very upset that Neoen failed to contact me at that earlier time as it would have given me greater options to consider my future should the project be approved.

To put it mildly, the last 14 months have been the most distressing and uncertain time of mine and my family's lives. We now feel that the area of the Southern Flinders that we love and have lived around for the last 20 years is at serious risk of being degraded by Neoen's proposal. It is not just the natural environment that we are concerned for but also the future of the whole town. One only needs to know the impact of the wind farm at the town of Waterloo and its desertion by residents to understand this concern.

Please know that I am not opposed to renewable energy and have no objection to the solar energy component of the project. I just feel that when a project of this nature becomes so highly contentious and has the potential to impact negatively on so many that it needs to be questioned seriously if it is truly in everyone's best interests.

Sincerely, Mark J Cunningham.

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: KAYLENE CUNNINGHAM

My phone number: 0400 400 406

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 8 HELLER COURT

PORT PIRIE SA Postcode 5540

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [✓] a private citizen

The address of the property affected is 451 Hughes Gap Road Postcode 5523

The specific aspects of the application to which I make comment on are: THE SIZE AND PROXIMITY OF THESE STRUCTURES IS MOST ALARMING AND WILL BE SURE TO HAVE A NEGATIVE IMPACT ON THE LOCAL WILDLIFE AND NEARBY RESIDENTS WITHOUT OFFERING ANY BENEFITS TO THEM. ALSO THEY WILL INTERFERE WITH WIFI INTERNET CONNECTIONS SERIOUSLY AFFECTING ALL STUDENTS WITH THEIR EDUCATION.

I
- [ ] ~~wish to be heard in support of my submission~~
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] ~~appearing personally~~
- [✓] being represented by the following person : Mark Cunningham

(Cross out whichever does not apply)

Date: 23-6-2018 Signature: K C

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
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Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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My name: Katie King

My phone number: 0437494081

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 451 Hughes Gap Rd

Crystal Brook SA Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 451 Hughes Gap Rd Postcode 5523

The specific aspects of the application to which I make comment on are: The size and location of the turbines are innappropiate for the area - I am very concerned abat the noise they will generate and the interferance to our local tv and wifi signals as I live in the house closest to the wind farm

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- ~~[ ] appearing personally~~
- [✓] being represented by the following person : Mark Cunningham

(Cross out whichever does not apply)

Date: 25/6/18 Signature: R. K

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

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DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
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My name: JOHN CUNNINGHAM

My phone number: 0427 180088

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 8 HELLER COURT

PORT PIRIE Postcode 5540

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [✓] a private citizen

The address of the property affected is 451 Hughes Gap Road Postcode 5523

The specific aspects of the application to which I make comment on are: THE WIND TOWERS WILL DEDRACT FROM THE NATURAL LANDSCAPE OF A VERY PLEASANT LANDSAPE BEETALOO IS A VERY good SUNDAY DRIVE AND WILL BE SPOILED IF THEY GO AHEAD. ALSO IT WILL EFFECT THE PEOPLE LIVING IN THIS AREA.

I
- [ ] ~~wish to be~~ heard in support of my submission
- [✓] ~~do not wish~~ to be heard in support of my submission

(Please ~~tick~~ one)

by
- [ ] ~~appearing personally~~
- [✓] being represented by the following person : Mark Cunningham

(Cross out whichever does not apply)

Date: 28.6.18 Signature: [signature]

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
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Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
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My name: Jade-Louise Cunningham

My phone number: 0499817276

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 451 Hughes Gap Rd
Crystal Brook SA Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 451 Hughes Gap Rd Postcode 5523

The specific aspects of the application to which I make comment on are: Neoen has misrepresented the public support in the community for their windfarm project. In May of 2017, I helped instigate a petition protesting the location of the turbines that gathered around 800 signatures. This was tabled in state parliament by Geoff Brock in July 2017.

I
- [✓] wish to be heard in support of my submission
- [ ] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] ~~appearing personally~~
- [✓] being represented by the following person : Mark Cunningham

(Cross out whichever does not apply)

Date: 25/6/2018 Signature: _____

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

169

DPTI:scapreps

From: Pam Pilkington <pam@pcc.farm>
Sent: Wednesday, 27 June 2018 11:00 AM
To: DPTI:scapreps
Subject: Crown Development Application 354/V003/18 - Neoen Australia Pty Ltd
Attachments: Development Act, 1993, S49_49A -Crown Development Representaion on Application - Pamela Pilkington.pdf

To the Secretary,
State Commission Assessment Panel

Please refer to my attached submission detailing aspects of Crown Development Application 354/V003/18 - Neoen Australia Pty Ltd., for your consideration.

Kind Regards,
Pam Pilkington

Pamela Pilkington
PO Box 31
CRYSTAL BROOK SA 5523
Mobile: 0427 367 046

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DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
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My name: Pamela Pilkington

My phone number: 0427367046

PRIMARY METHOD(s) OF CONTACT: Email address: pam@pcc.farm

Postal address: Box 31, CRYSTAL BROOK

Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [M] owner of local property
- [M] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 15 TALBOTS RD CRYSTAL BROOK Postcode 5523

The specific aspects of the application to which I make comment on are:

please refer to my attachment accompanying this email, titled Pam Pilkington Submission Development Number 354/V003/18.

I
- [Y] wish to be heard in support of my submission
- [ ] do not wish to be heard in support of my submission

(Please tick one)

by
- [Y] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 27-6-2018 Signature: Pilkington

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

CROWN DEVELOPMENT APPLICATION 354/V003/18 – NEOEN AUSTRALIA PTY LTD

I am a resident of Talbot Road, Crystal Brook and have serious concerns regarding Neoen's Application to build a windfarm of twenty-six towers, up to two hundred and forty metres in height, in close proximity to residents and the township of Crystal Brook.

I am a supporter of renewable energy, having solar hot water for our home when it was built in 2004, and we were among the earlier adopters of solar energy with 50 panels installed in 2009.

I support the solar energy and battery storage components of Neoen's application but reject the windfarm component situated in the Southern Flinders Ranges as an inappropriate location. I request that the State Commission Assessment Panel consider the following issues in their assessment of Neoen's application:

VALIDITY OF APPLICATION.

Part 1, Appendix D, includes a letter from Don Russell, Chief Executive Department of Premier and Cabinet, which states:

"With a three-month extension, a development application under this Crown sponsorship variation must now be lodged with the State Planning Commission on or prior to 31 March 2018. If this is not achieved by that time, my support under Section 49(2)(c) of the Development Act 1993 for Neoen's Crystal Brook Energy Park will lapse."

The SA Public Register Summary for Development Number 354/V003/18, printed from the SA Planning Portal website on 31/05/2018, shows that the lodged date was 05/04/2018. When a Crystal Brook resident sought confirmation of the lodgement date via a phone call to Lee Webb, Contact Officer for the State Commission Assessment Panel on 13/6/2018, she was assured that the date lodged was 05/04/2018 as that was when the payment and papers were received. Subsequently, however, this date on the SA Planning Portal was changed on 15/06/2018 to read 29/03/2018. I question the reasoning for this change? Furthermore, I received a letter from the Hon Stephan Knoll, Member for Schubert and Minister for Transport, Infrastructure and Local Government, and Minister for Planning, which was dated 11 May 2018. In the second paragraph, he states,
"I can confirm that a development application for this project was lodged with the State Commission Assessment Panel (SCAP) on 5 April 2018".

The application did not meet the timeline requirements for Crown Sponsorship support under Section 49(2) (c) of the Development Act 1993, which raises the question, "Is it a valid application?"

CONFLICT OF INTEREST

Code of Ethics for South Australian Public Sector – "Public sector employees will avoid actual or potential conflicts of interest"

There is a Conflict of Interest. The Presiding member for the State Commission Assessment Panel is also a Principal Planner for GHD, the company engaged by Neoen to provide the following reports in their application:

- Volume 1 – Project Description and Impact Assessment Findings
- Draft Construction Environmental Management Plan
- Volume 2 - Project Description and Impact Assessment Findings
- Traffic Impact Assessment Report
- Electromagnetic Interference Assessment

A further Conflict of Interest exists with another member of SCAP who is the Honorary French Consul for South Australia. Neoen is a French company.

Without a Conflict of Interest being declared by both parties, and the Presiding Member taking no part in the discussion and decision-making procedures, I cannot have confidence in the integrity of the assessment process.

UNPROFESSIONAL APPLICATION

Of great concern is the poor quality and substandard presentation of Neoen's application. It is apparent that it has been prepared using 'cut and paste' from earlier versions which are not relevant to this project, contains references not applicable, and there are numerous errors in formatting and anomalies in facts, demonstrating inadequate proof-reading and checking for accuracy.

The application contains numerous anomalies, some examples of which are listed below:

1. *Volume 1, Page 1-SCAP Application on Notification – Crown Development, -Zone/Policy Area is listed as Primary Production Zone Port Pirie Regional Council,* **however, Turbine CB 18 is situated in the Port Pirie Regional Council Landscape Protection Zone.**
2. *Volume 1 p3- "The redesign of the project also took into account concerns expressed by the Beetaloo Valley Association, with the result being that no BVA dwelling is any closer than 2.9km to a turbine, with the majority at a distance well over 5km."* **That statement is not correct**. The closest Beetaloo Valley residence is only 1.3kms away.
3. *Volume 1, p 17 Table 3.1– Wind -'Extending along the ranges south and* ***north*** *of Wilkins Highway* – inconsistent with other tables and maps indicating no turbines are north of Wilkins Highway. Property Certificate of Titles are not consistent throughout the application. CT5516/886 and CT6187/686 are in Northern Areas Council.
4. *Volume 1, p 32, 4.2- "The portion of the site covered by the Port Pirie Development Plan is within the 'Primary Production Zone'. The boundary of the Primary Production Zone follows the alignment of the gas pipeline which means that the whole of the project is location(sic) within this zone".* **This is not correct.** The Primary Production Zone follows the water pipeline not the gas pipeline, which means that Turbine CB18 is in the Landscape Protection Zone.

5. Volume 2, GHD's Traffic Impact Assessment Report(TIAR), is very poorly presented with numerous formatting errors, incorrect information, references and data, and photographs from previous projects. I found three occurrences of directions of photographs being incorrect (e.g. looking East when it should have read West), Table 10 with no data in it, at least sixteen occurrences of *"in Error! Reference source not found."*, seven randomly inserted occurrences of *"Figure 17 Principal Heavy Vehicle OMD Routes providing access to the proposed site, from east of the Victorian/South Australian Border"*, and 2 randomly inserted occurrences of *"Table 16 Level of Service (LoS) vs AADT for two lane, two way rural roads, assuming rolling terrain and K=0.10 (Austroads GTEP part 2, table 3.9,1999"*.
6. The Traffic Impact Assessment Report 5, states *"The most up to date provisional Crystal Brook Energy Park layout comprises of **29** wind turbines as shown in Error! Reference source not found.**3**"*. Maps in Figure 3 on page 5, and Appendix A map on page 59, are from a previous version with **28** turbines in different locations to the final plan which only has **26**.
7. All GHD map layouts throughout the application are shown as "Draft".
8. Volume 2, last page has not been signed by GHD or even listed the author(s) to verify ownership of the document.

These basic errors are inexcusable. Page 2 of the Transport Impact Report states *"GHD Pty Ltd has no responsibility or obligation to update this report to account for events or changes occurring subsequent to the date that the report was prepared."* **This does not absolve Neoen's responsibility to ensure that the reports submitted in the application were updated to the final version of the proposal.**

TURBINE SIZE AND CAPACITY

It is a telling sign that two of the major host benefactors of the turbines, will not be residing in proximity of the windfarm, yet the population of the Crystal Brook township and neighbouring residents will endure the legacy for decades to come. These turbines will be the largest in Australia, and the second largest on-shore turbines in the world. Neoen's proposal is for turbines up to 240 metres high with a capacity of 4.8MW, compounded by very densely clustered positioning. The accumulative effect has not been tested and is unknown. None of the planning assessment, compliance guidelines or safeguards for nearby residents and land uses have been updated to correlate with these substantial increases, almost doubling in size and capacity, and there are no precedents to assess the issues. The 'goal posts' have been significantly shifted by Neoen, with no accompanying 'catch-up' with compliance and monitoring regulations. **I urge the SCAP to place a moratorium on further windfarm developments until appropriate and rigorous independent testing can be carried out.**

COMMUNITY AND STAKEHOLDER ENGAGEMENT

In Part 1, 1.3 Neoen state
"In February 2017, once agreements had been finalised with the majority of involved landowners, the engagement process extended to neighbours within 3km of the project boundary and a range of other relevant stakeholders."

In early February 2017, we received mail notification from Neoen regarding the proposal, and an offer for discussion at a home visit, which we accepted. Prior to Neoen's visit, I visited several other Talbot Road residents, none of whom had received Neoen's mail communication, so weren't aware of Neoen's proposal. All residents I visited, live in closer proximity to the proposed turbines than our home.

In June 2017, over 600 people signed a petition against the windfarm proposed at that time, and that petition was presented to the local Member, the Hon Geoff Brock, who at the time, had the cabinet positions of Minister for Regional Development and Minister for State and Government Local Relations. That proposal was later paused and redesigned in an attempt to locate the turbines to meet with Port Pirie Regional council's Primary Production Zone. As previously stated, one turbine is still located in the Landscape Protection Zone.

There was no direct consultation from Neoen with nearby residents when the latest proposal of 26 turbines at 240 metres in height was presented. The only community consultation was held in the Crystal Brook CWA clubrooms on March 26th for four hours. In conversations with locals in recent weeks, it is very apparent that many people, including business owners, have little or no knowledge of the project, have no idea how close to the town the turbines will be, have no concept of the immense height of them or how closely clustered together they are, and no knowledge of the impact they will have on television reception and wireless broadband signals.

In Volume 1, GHD report page 46, Neoen state: "Potential minor service degradation to local community, i.e. TV reception within 10 km of wind farm may be affected."

The furthest extremity of the township of Crystal Book is within 5.5km of the nearest turbine and 8.6 kms of all 26 turbines. The impact on residents' television reception will be significant having that many turbines so close.
Many people have commented about the turbines they can see at Clements Gap windfarm west of Crystal Brook, which has the closest turbine 15.6kms from the main street of Crystal Brook and turbines half the height of Neoen's. They have said that it doesn't bother them, and they don't foresee an issue with the proposed project, until they are informed of the scale and close proximity of this proposal and made aware of Neoen's documented impacts. Then they become alarmed and incensed.

Clearly, Neoen's community consultation process has been inadequate and ineffective.

IMPACTS

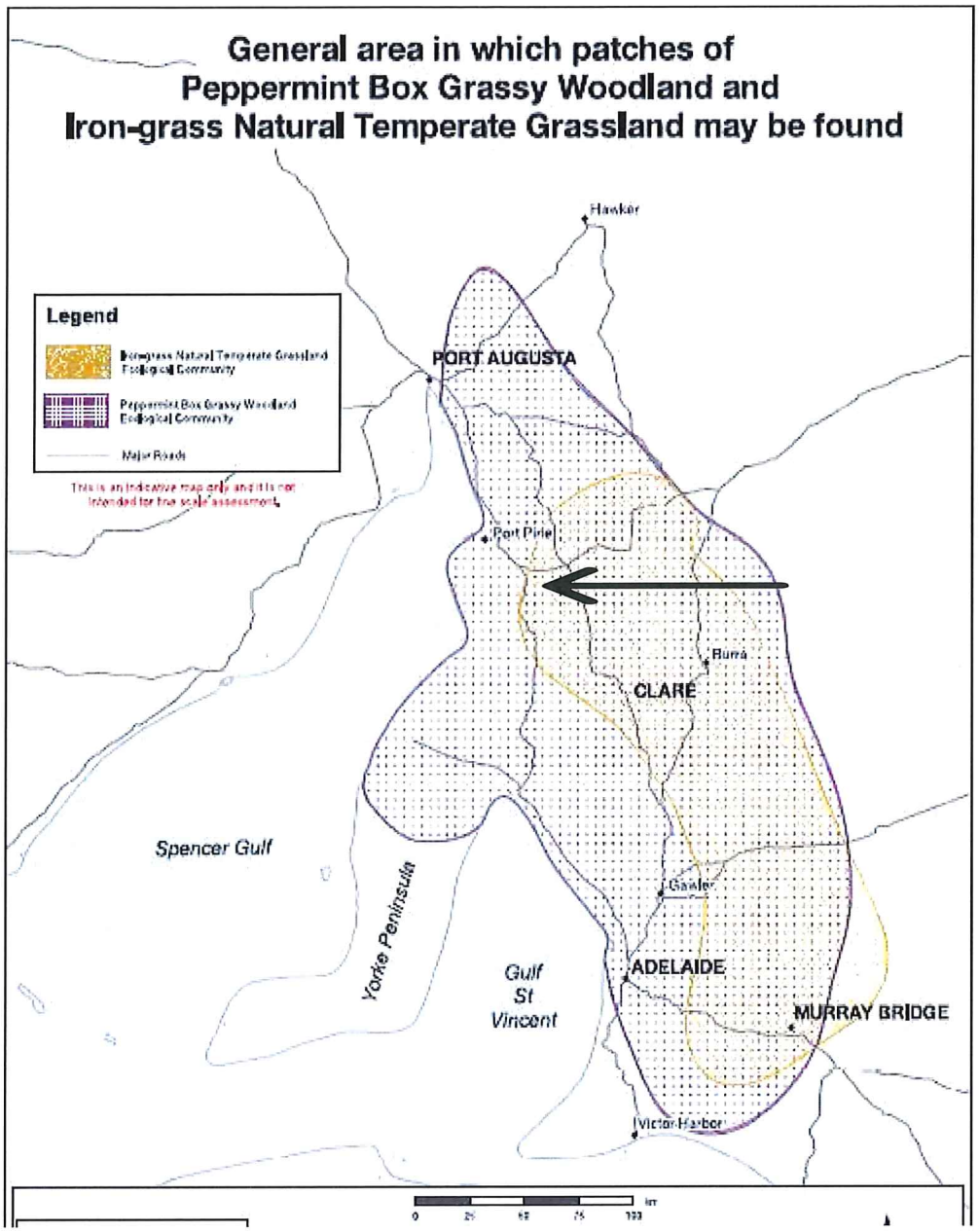
FLORA AND FAUNA

- *Volume 2, Executive Summary page iii "The flora and fauna field survey for the Crystal Brook site was undertaken from the 27th February to the 2nd of March 2017 with follow up surveys undertaken in May 2017 and February 2018".*- Flora surveys are most accurate when taken in Spring when the majority of plants are in flower, and most noticeable. The surveys conducted for Neoen's report were mostly done during the hottest and driest months of the year when annuals such as lilies and daisies have died off, and herbs, forbs and shrubs are dormant or

not flowering, consequently giving an inaccurate account of the range and diversity of native species present. None of the flora surveys were conducted in Spring.

- Northern and Yorke Natural Resources Strategic Plan –Aspirational Target - Healthy Terrestrial Ecosystems – Resource Condition Target B1. Viable Vegetation Communities -*By 2030, maintain the condition of the region's 1,200,000 ha of remnant native vegetation, and improve the condition of 15% from 2008 levels.*
    - The disturbance to the natural habitat in this proposed concentrated area, approximately 3.2kms by 3.5kms, will be extensive, accommodating 26 access tracks and underground cabling, 26 concrete foundations, 26 crane hardstand areas and additional temporary laydown areas at each site for parts.
    - **This contravenes the N&Y NRM Strategic Plan Aspirational Target and Resource Condition Target to improve the condition of 15% of remnant native vegetation from 2008 levels.**
- Northern and Yorke Natural Resources Strategic Plan –Aspirational Target - Healthy Terrestrial Ecosystems – Resource Condition Target B3. Increased Connectivity – *By 2030, there is an increase in ecological connectivity with and between landscapes from 2008.*
    - Crystal Brook Energy Park Windfarm is located in the Southern Flinders Ranges and dissects the Southern Ranges directly between Bowman Park and Hughes Gap which will impact substantially on the connectivity of flora and fauna between the two landscapes. Birds SA list 64 species recorded to date at Bowman Park, including the Endangered Diamond Firetail. Reference: https://birdssa.asn.au/location/bowman-park-crystal-brook/
    - Lace Monitors and Echidnas are commonly sighted at and near Bowman Park. Three Lace monitors were spotted on one day when our family was there.
    - Connectivity of landscapes which support the flora and fauna of Bowman Park will be disrupted with 26 turbines and associated infrastructure built in the path. Crystal Brook creek runs through the centre of the proposed site, and contains a natural spring at Bowman Park, a crucial water supply for birds and wildlife.
    - **This contravenes the N&Y NRM Strategic Plan Aspirational Target and Resource Condition Target to increase in ecological connectivity with and between landscapes from 2008.**
    - Of great concern is the cumulative effect on biodiversity. Almost every north-south range traversing from Spencer Gulf towards the River Murray plains in the East, is littered with wind turbines clustered along them. What monitoring is being carried out on a landscape scale to determine the long-term cumulative effects on our flora and fauna? When the wedge-tailed eagle has very little natural habitat left to survive, it's too late.
- The Environment Protection and Biodiversity Conservation (EPBC) Act Policy Statement 3.7 describes Nationally Threatened Species and Ecological Communities which covers Peppermint Box (Eucalyptus odorata) Grassy Woodland of South Australia and Iron-grass Natural Temperate Grassland of South Australia. As can be seen in the map below (EPBC Map), **both** plant communities exist in the windfarm area.

EPBC Map – black arrow indicates both threatened vegetation communities at the proposed windfarm site



Volume 1, page 48, GHD report states-"The flora and fauna survey undertaken identified a number of constraints relating to vulnerable species within project (sic) area. In particular: (et.al) An intact vegetation community, Eucalyptus odorata."
Volume 2, page 48, EBS ecology report states-"The Mallee vegetation on the eastern side of the Mercowie Creek was intact and in moderate condition with substantial understorey species diversity despite evidence of ongoing grazing. While this area was not surveyed extensively, this area is considered to be of high conservation value due to the likelihood of annual and ephemeral threatened species being present as well as being a substantial intact patch to which any fragmentation would reduce local biodiversity values through increased edge effects, disruption of animal movement pathways and potential changes in hydrology."

By EBS Ecology's own admission, they did not survey the area extensively, and the surveys were carried out at inappropriate times of the year, namely, not in Spring, therefore their findings are not conclusive. What other endangered species are in the windfarm zone, which aren't published? These critical environments must be protected. Observations by residents living close to a nearby windfarm built by Neoen, is that once construction begins, workers have little or no regard for the natural habitat and landscape. Once the landscape has been devastated, it's too late. What independent monitoring will take place to oversee that this does not happen?

TOURISM

Crystal Brook has traditionally been known as the place "Where the Flinders Begin". Bowman Park is a tranquil, picturesque, recreational facility for day visitors, and in recent years, for RV campers who are permitted to stay for forty-eight hours.

A small group of volunteers formed a management committee in 2009 to restore the park to a safe, family friendly environment, after several years of no management and being wrecked with vandalism. The volunteers have worked tirelessly, to return the park to its natural beauty and now has many visitors and campers from Australia wide on a daily basis and even overseas. The peace, tranquillity and natural beauty, birdlife and wildlife are commented on frequently by visitors, and comments made on the campers "WikiCamps" website, is testament to their appreciation of the volunteers' efforts and their enjoyment while visiting the park.

Six wind turbines are planned within a 2 kilometre radius of Bowman Park campground, and all 26 turbines are less than 5 kilometres. There are walking trails to the ridges on both the east and west flanks of Bowman Park, with magnificent views of the Flinders Ranges to the north. These ranges (pictured) are where 26 turbines will be situated near Bowman Park. The visual amenity for visitors will be devastating.

The campground is in a gully and therefore sheltered, so when it's calm at the campground, but breezy at elevations of 300 plus metres above, campers will be subjected to the cumulative noise and infrasound effects of up to 26 turbines. Visitor numbers and the associated spin-off benefits to the local businesses and community, will be significantly impacted.
The access road to Bowman Park turns-off from an elevated section of Huddleston Road. Bowman Park road descends down to the entrance for 1.5kms heading to the north, and from the turn-off, the visual impact of all 26 turbines immediately behind the park, will look like an industrial eye-sore, all the way down to the park entrance.
The Heysen trail follows the creek line right through the centre of the project area. Walkers trekking from the north will be subjected to the sight of all turbines for many kilometres from The Bluff near Port Pirie, south to the windfarm.
No photomontages were provided by Neoen from the Huddleston Road turn-off to Bowman Park, to depict the view that tourists would encounter as they drive down to the entrance.

TRAFFIC IMPACT

Much of the information reported relates to previous proposals. There are numerous anomalies regarding the dimensions of components being transported, with little or no information on the actual turbine components which are proposed in the final plan. The length of OD vehicles will need to be increased to accommodate the longer blades and hubs, which in turn will require further assessments for clearances, bridge limits, climb grades and turning movements. Larger cranes will need to be transported to the sites, to accommodate the much larger towers.

Volume 2, Traffic Impact Assessment Report, p 47states, *"With blades of up to 55 m long, the semi-trailer will likely be approximately 68 m long".* **The proposed blades will be 79 m long** (Volume 2, Landscape and Visual Impact Assessment, page 7), **so how long will the OD vehicles need to be to carry these, and what other consequences will that raise?**

Site Access

*Volume 2, TIAR, page 36 states, "**A primary road safety concern during construction is vehicle sight distance at key intersections and the site access point. Delivery vehicles will often be slow moving and take time to clear the carriageway, hence it is critical that approaching vehicles have enough time to reduce speed and avoid collision."***

"The sight distance to both the eastern and western approach meets Austroads requirements for passenger vehicles. ***However, sight distance to the eastern approach fails to meets (sic) requirements for heavy vehicles, raising a substantial safety concern.***"

"Preliminary measurement at the likely site access point for Crystal Brook South Wind Farm shows sight distance from the intersection would be in excess of 400 m, exceeding Austroads requirements for both heavy vehicles and passenger vehicles."

These statements raise several serious concerns for me regarding safety to other road users.

- Although the report does not specify where the access point will be, Figures 26 and 27 on page 37 and 38, illustrate where the proposed access point is (taking into account that Figure 26 states it looking "west" when in fact it is east, and Figure 27 states that it is looking "east", when it is actually looking west)

- If this is the access point, it is truly alarming for the following reasons:
  - It is located at the **crest** of a hill (western ridge of Hughes Gap), with limited vision either side of the crest.
  - It is a road-train route.
  - It is a school bus route.
  - It is a grain freight route used throughout the year for moving grain from the Gladstone GrainFlow site to the port at Wallaroo, and more importantly is a major route for grain farmers and contractors throughout the Upper North grain producing region for transporting semi-trailer and road train loads of grain during the very busy harvest season.

Regular transport users of Wilkins Highway will be greatly inconvenienced and placed in significant danger if they are required to suddenly stop on the top of the hill at the access point for the wind farm components, indicated in Figures 27 and 28.

The safety of, and inconvenience to, other road users should be of paramount consideration and an absolute priority, when planning where the windfarm components will be transported, major intersections used and access points to private property .

Volume 1, p20 –"The main access tracks will provide access to the WTG sites and will be developed to take the weight of WTG transport and construction vehicles and the cranes used to erect the turbines. These will be located in consultation with landowners and the ecology advisors to ensure a balance between farming operations and protection of native vegetation."

This has not happened at Hornsdale windfarm, where landholders' access track location requests have been ignored. Neoen has carved roads where it suits them, dissecting paddocks, causing distress to landholders and disruption to their farming operations and precision agricultural practices.

My opinion is that the SCAP should regard GHD's Traffic Impact Assessment Report as being flawed, incorrect and unsuitable to assess this proposal.

Windfarm access point

Windfarm access point

Looking east towards the crest on the righthand side road verge

VISUAL IMPACT

Volume 2, landscape and Visual Impact Assessment(LVIA) Page 92 states "This LVIA identified 14 non-host residential dwellings within 3km of the wind turbines and determined that the majority of these would not experience a significant (high) visual effect as a result of the Project."

"Proposed mitigation works, including landscape screening, is considered likely to mitigate views toward the majority of the Projects principal assets."

"Overall this LVIA concludes that the Project would not have an unreasonable impact on the landscape character, or the visual amenity of people living, working, or travelling through the landscape surrounding the Project Site."

I strongly dispute their conclusions. Our home is 3kms from the two closest turbines. The proposed towers will stand approximately thirty-two metres taller than the Nyrstar Stack in Port Pirie. People familiar with this district will readily appreciate that they will be very imposing structures, when they imagine 26 towers, taller than the Pirie Stack, placed clustered together along the Southern Flinders Range. The visual impact will be substantial, from any aspect. I am amused that Neoen were offering at their Information Session, to supply vegetation to screen the turbines from view, and sadly, some people were appreciative of their offer. It will take years for their trees to grow to a sufficient height to providing a screening effect. As soon as one takes a step either side of the vegetation, the turbines will still be in view. Neoen also claim that several locations will be partially or fully screened from the turbines, so the visual effect will be reduced. It's very difficult to screen a structure that's 240 metres high, on top of a ridgeline.
Every morning when I open my bedroom curtains, I will be viewing 26 turbines from the window – (refer to Volume 2, Green Bean Design Report page 82, Photomontage P1. Figure 26, Talbots Road), which was taken just to the east of our home.
I enjoy the natural beauty of the skyline just as it is. I love working in my garden with the picturesque ranges as a backdrop. I do not want it destroyed with these enormous structures.

NOISE AND INFRA SOUND

Another great concern for me is the impact of noise and infrasound and potential health impacts of those of us living nearby. These are the first turbines to be built in Australia of this magnitude and output. Guidelines currently in place do not consider these structures, and testing has not been carried out to assess the long-term ramifications for continuous exposure to the output of these turbines. There are no precedents in Australia. Until comprehensive investigations are undertaken, and outcomes assessed, then approvals for, and installation of these structures should cease.

DEVALUATION OF RURAL LIVING PROPERTY VALUES

This proposed project is situated nearby to many Rural Living properties, near Crystal Creek Estate in the north eastern edge of Crystal Brook, Bowman Street Extension, Goulter Road, Beetaloo Valley, and other nearby locations.
It has been argued in previous studies that there are no reductions in land values near windfarms, and in fact in some instances, property values have risen. That could truly be the case, when

considering that most windfarms are in rural settings, away from townships, and many property owners are hosts, receiving significant financial rewards for accommodating the turbines. These "cashed-up" landholders are in the advantageous position of having cash reserves readily available to outbid non-associated neighbouring landowners when parcels of land become up for sale, thus driving up and inflating land values.

However, in this instance, there are very many non-associated properties nearby, which have developed because of their natural appeal, tranquillity, beautiful views and open spaces. Many young families have built their dream homes in their dream location. With 26 turbines overbearing their properties, and detracting for the appeal they were established for, their properties will accordingly devalue, because no one will want to buy them and live there. There is already evidence in other states where this has happened when windfarms have been located close to communities.

CONCLUSION

As indicated, I have listed many issues in which this proposal will negatively impact our local community of Crystal Brook, on tourism and the compounded effect on local businesses, on the threats to our valued and endangered biodiversity, our safety on the roads during construction phase due to the slow moving over-dimension vehicles manoeuvring road junctions and onto private properties, the effect of loss of visual amenity and noise and infrasound impacting our quality of life, and finally, the devaluation of our life's savings invested in our homes.
At what cost to humanity do we blindly continue to pursue the rush into wind energy, without considering emerging technologies and a holistic plan for our future energy supplies.

'THE STRUGGLE FOR POWER'

"The first decade of Australia's renewable energy scramble can be likened to a modern-day gold rush.

Scouts of prospectors swarmed potential sites for wind farms with little regard for the impact they would have on unwary rural communities or the electricity system as a whole. The hills from South Australia to Queensland are littered with tales of sharp practices where neighbours were pitted against neighbours to sign up wind-farm development sites.

Often leading the charge were small companies that sold the sites and development approvals to bigger organisations with the deep pockets needed to build.

A report by the National Wind Farm Commissioner acknowledges the history of community division, unfair contracts, inadequate communication, potential conflicts of interest and disregard for complaints of human suffering. The Wind Farm Commissioner set out a road map for how the industry could clean up its act. And the renewables industry insists that lessons have been learned.

But the legacy of initial haste bears all the hallmarks of any gold rush from yesteryear."

Pam Pilkington,
15 Talbots Road,
CRYSTAL BROOK SA 5523 **pam@pcc.farm**

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DPTI:scapreps

From: Ian Peterson <peterson-ic@hotmail.com>
Sent: Wednesday, 27 June 2018 9:42 AM
To: DPTI:scapreps
Subject: Representation - Development Number 354/V003/18
Attachments: Ian Peterson - Appendix 2 of Representation (354-V003-18).pdf; Ian Peterson - Appendix 7 of Representation (354-V003-18).pdf; Ian Peterson - Application Representation Form (354-V003-18).pdf; Ian Peterson - Representation on Application (354-V003-18).pdf

Dear SCAP

I wish to make representation to the State Commission Assessment Panel regarding Neoen's proposed Crystal Brook Energy Park (Development Number 354-V003-18).

I have attached the following documentation in support of my representation:

- Completed Representation Form
- Representation on Application
- Appendix 2 – Crystal Brook Wind Farm Noise Impact Assessment Commentary
- Appendix 7 – Wind Farm Technical Paper – Environmental Noise – Sonus (November 2010)

As indicated on my representation form, I also wish to be heard by the Panel to ensure key points of my representation are clear.

Please confirm receipt of this email and the four attachments.

Best Regards.....Ian Peterson
0407 391 976

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DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: Ian Peterson

My phone number: Home: (08) 8636 2310 Mobile: 0407 391 976

PRIMARY METHOD(s) OF CONTACT: Email address: peterson-ic @hotmail.com

Postal address: 284 Beetaloo Valley Road

Beetaloo Valley Road SA Postcode 5523

<u>You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.</u>

My interests are:
- [X] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 284 Beetaloo Valley Road Postcode 5523

The specific aspects of the application to which I make comment on are: See attachment

I
- [X] wish to be heard in support of my submission
- [ ] do not wish to be heard in support of my submission

(Please tick one)

by
- [X] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 27 June 2017 Signature: I.C.Peterson

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or <u>scapreps@sa.gov.au</u>

The Secretary
State Commission Assessment Panel
GPO Box 1815
Adelaide SA 5001

Ian Peterson
284 Beetaloo Valley Rd
Beetaloo Valley SA 5523

By Email: scapreps@sa.gov.au

27 June 2018

Dear SCAP Secretary

Ref: Neoen Australia Pty Ltd Development Application Number 354/V003/18

I am making this representation to the State Commission Assessment Panel (SCAP) as I am incensed by what, in my opinion, are false and misleading claims and significant omissions and errors in the Neoen development application and I want to ensure that the SCAP are fully aware of the full extent of the Neoen subterfuge.

As a person specifically mentioned in the Neoen development application, an impacted resident (H19B – a late entry?) and having been involved in the Neoen community and stakeholder engagement process since the Crystal Brook Energy Park was first communicated to the public in February 2017, I also feel somewhat qualified to comment on the lack of integrity exhibited by Neoen in their dealing with the community.

As an example of the subterfuge and to illustrate the level of impact on me and my family, Figure 1 shows a photomontage from the Neoen development application (Ref.8, p162 of 408). It clearly illustrates the closeness of the proposed development to my home and the expected view from my property. Who would want to live this close to the turbines; neither do we.

In their 94-page Landscape and Visual Impact Assessment (LVIA), Neoen's consultant includes the following disclaimer (Ref.8, p158 of 408):

> *"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 or distance."*

The executive summary of the LVIA report defines the impact as 'moderate'; even considering the imaging errors in their disclaimer. On their 4-point rating scale, moderate is just under the highest impact rating:

> *"This LVIA has determined that the visual effect of the Project is likely to be moderate from the majority of publicly accessible locations surrounding the Project, and that the proposed Project:*

- *would have an overall moderate visual effect on the Crystal Brook township and the small number of localities beyond the Project Site"*

A 'Moderate' consequence for the 'Majority' of locations equates to a 'Very High' impact on the risk matrix!

Despite this detailed report from their consultant, Neoen make the following statement in Section 5 of their development application (Assessment of impacts, Ref.7, p48 of 140):

> *"Overall this LVIA concludes that the Project would not have an unreasonable impact on the landscape character, or the visual amenity of people living, working, or travelling through the landscape surrounding the Project Site."*

Based on the consultant's report, the Neoen statement is simply *not true*. Unfortunately, the Neoen development application is littered with similar *false and misleading statements*. Perhaps they are hoping that the SCAP members will just read the executive summary and not interrogate the detail.

Whilst it is clear that my visual amenity would be utterly destroyed if this development proceeds, of much greater concern is that due to the close proximity and negative noise characteristics, the proposed wind turbines will dominate the quiet soundscape at my home and create serious harm to the health and wellbeing of my family.

Photomontage P3 - Detail view through 30 degrees

Figure 1 – Photomontage of the view from my Home

Having reviewed the Neoen development application in detail, I would like to highlight just some of the significant variances relating to the following aspects of the Neoen application:

1. Lapsed Crown Sponsorship
2. Incomplete and Inaccurate Environmental Noise Assessment
3. Adverse Health Impacts – including excerpts from an Administrative Appeals Tribunal decision relating to the health impacts of wind turbine noise
4. General Environmental Duty, Code of Ethics and Potential Fraud
5. Bushfire Risk
6. Community Engagement

I apologise for the length of this representation; it would have been much shorter had this project been managed more professionally and had Neoen not littered their development application with so many errors and omissions.

1. Lapsed Crown Sponsorship

The SA Government document "Sponsorship Guidelines and Principles – February 2018" requires Government Departments proposing to enter into a sponsorship agreement to ensure the following:

> *"There must be no real or perceived:*
> - *Conflict of interest*
> - *Implication of favoured treatment to the sponsor*
> - *Overt endorsement of the sponsors products or services.*
>
> *Sponsorship agreements shall only be accepted if they will provide a net benefit for the government with no detriment to the public interest.*
> *All sponsorship agreements must be able to withstand public scrutiny."*

Even the most cursory review of the Crown's Sponsorship of Neoen would be hard pressed to not question the '*favoured treatment*' shown Neoen and the '*overt endorsement*' of their product. It is also a fact that the previous Government had a political agenda regarding wind farms and that the level of diligence exercised to determine that this project will create "*...no detriment to the public interest."* was non-existent.

Both the Crown and Neoen were fully aware of the adverse health effects created by wind turbines. Despite this awareness, Crown Sponsorship was provided to Neoen on 6 February 2017. This formal agreement contained terms and conditions binding Neoen and the Crown. Where was the public scrutiny of this sponsorship agreement?

The original Crown Sponsorship was valid until 31 December 2017. In October 2017, Neoen sought, an extension to the Crown Sponsorship agreement until 31 March 2018. In his response to Neoen on 21 November 2017, Dr Don Russell (Chief Executive - Department of the Premier and Cabinet) clearly imposed several conditions on Neoen as prerequisites to maintaining Crown Sponsorship; including meeting the new lodgement deadline:

> *"With a three month extension, a development application under this Crown sponsorship variation must now be lodged with the State Planning Commission on or prior to 31 March 2018. If this is not achieved by that time, my support under Section 49(2)(c) of the Development Act 1993 for Neoen's Crystal Brook Energy Park will lapse."*

Formal lodgement of the Neoen Development Application is confirmed as 5 April 2018. As such, Crown support had lapsed by the lodgement date and the application must now be assessed as a Category 3 Development with all stakeholder rights and protections.

2. Incomplete and Inaccurate Environmental Noise Assessment

The observations and comments in this section of my representation are my personal opinion based on over 30-years' experience as a professional engineer with formal training and experience in environmental noise monitoring and are based on a detailed analysis of the Neoen development application, relevant legislation, acoustic theory, scientific research and a formal noise assessment study (Appendix 2) that I commissioned through independent acousticians Noise Measurement Services.

The following sections summarise some of the significant variances in the Sonus environmental noise assessment report (S5089C6) contained within the Neoen development application. Unless stated otherwise, references are to volume, PDF page number and section in the Neoen development application. Each section also contains a summary of my justification for defining the issues as a significant variance to the legislation, policies and guidelines. Where additional explanation is available, or required, it is referenced or included in an appendix.

2.1 Noise Policy Scope

Neoen Ref: Vol.2, p177, Section 1

> *"This report assesses the environmental noise from the Project by predicting the noise levels at beneficiaries and neighbours and comparing them with criteria provided by the Wind farms environmental noise guidelines 2009, and the Environment Protection (Noise) Policy 2007 as relevant."*

Variance: Schedule 1 of the Environmental Protection (Noise) Policy 2007 specifically excludes noise below the human audible range (20Hz). Page 13 of the Noise Policy Guideline qualifies this exclusion as follows:

> *"**Noise outside of the human audible range***
>
> *In extremely isolated situations, some noise sources may produce noise that is outside of the human audible range, but can still unreasonably interfere with a person's amenity. The exclusion of this situation is to ensure that such an isolated event is assessed using a specific procedure, rather than the Noise Policy."*

The Noise Policy only gives 'effect' to the assessment of audible noise (>20Hz). As required by the Policy, no 'specific procedure' has been applied to assess noise below the human audible range.

As Neoen and Sonus have not considered inaudible noise at all, their environmental noise assessment is incomplete. Noncompliance with mandatory provisions of the Policy constitute an offence under Section 34 of the EPA Act 1993.

Recommended Action: Additional analysis is required to assess the environmental impact of low frequency noise.

2.2 Development Area Zoning

Neoen Ref: Vol.1, p43, Section 4.2

> *"The portion of the site covered by the Port Pirie Development Plan is within the 'Primary Production Zone'. The boundary of the Primary Production Zone follows the alignment of the gas pipeline which means that the whole of the project is location with in this zone."*

Neoen Ref: Vol.2, p178, Section 3

> *"The project site is proposed to be located on land which spans Primary Production and Rural Landscape Protection Zones within the Port Pirie Regional Council Development Plan."*

Ref: Clause 4, p23 of the Guidelines for use of the Environmental Protection (Noise) Policy provides a definition of a 'Special Industry'

> *"- premises used for the purpose of providing water, sewage treatment, electricity, gas, power or other similar and broad public infrastructure on a large scale"*

Variance: WTG CB18 is within the Rural Landscape Protection (Ranges) Zone of the Port Pirie Regional Council and the Ranges Zone of the Statewide Windfarms Development Plan Amendment. Wind turbines are defined as a 'Special Industry' in the guideline to the Noise Policy and are a non-complying development in these areas. The Zone boundary follows the Morgan-Whyalla water pipeline not the gas pipeline as claimed in the Sonus report.

In addition, the location of CB18 requires high voltage underground cabling and other services to cross the SA Water pipeline easement in two locations, restricting pipeline access and increasing risk. No evidence of consultation with SA Water is provide.

Recommended Action: Deny approval of this development application or require Neoen to remove CB18 from the Landscape Protected (Ranges) Zone.

Further Reference: Ref. 3, p314 of 395

2.3 Development Plan Compliance and General Environmental Duty

Neoen Ref: Vol.2, p180, Section 4.2

> *"Compliance with the contemporary 2009 Guidelines is considered to satisfy the relevant provisions of the Development Plan that relate to wind farm noise."*

Variance: Noise below the human audible range (<20Hz) is specifically excluded from the scope of the Noise Policy and the Windfarm Guidelines. The wind turbine sound power spectrum includes significant energy in the inaudible 16Hz band. As such, compliance with the 2009 Guidelines does not fully discharge the general environmental duty for assessing noise. The noise assessment is incomplete and therefore fails to satisfy the provisions of the Development Plan.

As mentioned in Section 2.1 above, Neoen have not fully discharged their 'General Environmental Duty' as required under Section 25 of the Environmental Protection Act 1993.

Recommended Action: Additional analysis is required to assess the environmental impact of low frequency noise.

Additional References: Ref. 6 & 7

2.4 Noise Characteristics and Noise Source Penalties

Neoen Ref: Vol.2, p182, Section 7.1

> *"...when measuring or predicting noise levels for comparison with the goal noise levels of the Policy, adjustments are made for any dominant characteristic of tone, low frequency, modulation or impulsiveness. A 5dB(A) penalty is added if one characteristic is present, 8 dB(A) is added for two characteristics and 10 dB(A) is added for three or four characteristics."*

Neoen Ref: Vol.2, p185, Section 7.3

> *"Some of the equipment proposed for the Project will have audible tonality in close proximity, although the potential for it to be a dominant characteristic at the residences is diminished by the masking effect of...."*

Variance: Section 14(3) of the Environment Protection (Noise) Policy 2007 states:

> *"If the noise from the noise source contains characteristics, the source noise level (continuous) must be further adjusted..."*

Sonus have made no adjustments to source noise power levels to account for noise characteristics. They have dismissed the impact of noise characteristics without evidence or analysis, despite having submitted a detailed report on amplitude modulation to the Clean Energy Council in 2010 (Appendix 7).

Sonus have discounted at least one noise characteristics (tonality) as a result of an incorrect interpretation of the Noise Policy. No assessment of the other noise characteristics is presented, even though most of the equipment sound spectra clearly show significant low frequency noise.

Based on research and the limited 'indicative' equipment noise data provided in the Neoen development application, it is highly likely that there will be three noise characteristics associated with the proposed equipment.

Applying a 5dB(A) penalty for just one noise characteristic will result in predicted noise levels at H17 exceeding Policy limits. Applying the full 10dB(A) adjustment for three noise characteristics will result in predicted noise levels at several residences exceeding Policy limits.

Noncompliance with mandatory provisions of the Noise Policy constitute an offence under Section 34 of the EPA Act 1993.

Recommended Action: Noise characteristics must be reassessed against the actual requirements of the Noise Policy and be based on verifiable scientific data.

Additional References:

Appendix 1 – Noise Characteristics
Appendix 2 – Crystal Brook Wind Farm Noise Impact Assessment Commentary
Appendix 7 - Wind Farm Technical Paper – Environmental Noise – Sonus 2010

2.5 Instrumentation

Ref: Wind farms environmental noise guideline 2007 - Section 3.1

"The lower limit of the instrument measurement range must be chosen to provide accurate measurements which might be limited by the noise floor of the data acquisition device."

Neoen Ref: Vol.2, p186, Section 8.1

"The background noise was measured using Rion "NL-21" (Type 2) sound level meters, all of which have a noise floor less than 20dB(A)."

Ref: Sonus environmental noise assessment report - Appendix C: Background Noise Regression Curves – see Figure 2.

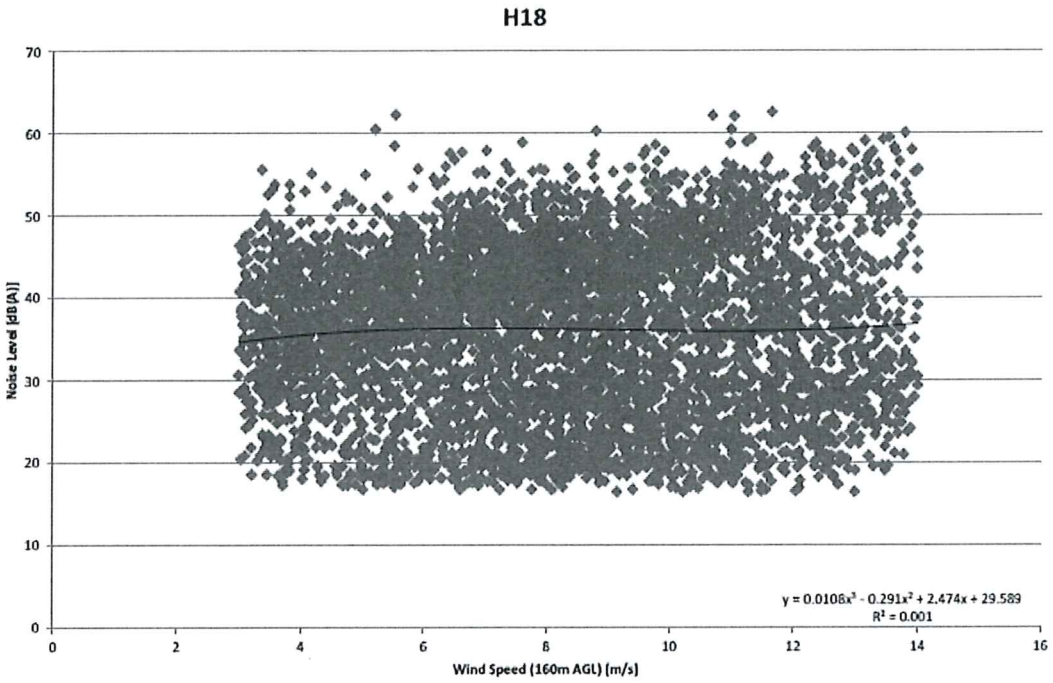


Figure 2 – Background Noise Regression Curve

Variance: The sharp cut-off of noise below 20 dB(A) suggests that the actual noise level is below the 'noise floor', or minimum detection limit of the sound level meter (SLM) used for the background noise measurement.

As stated in the Sonus report, the SLM used for the background noise measurement is a Rion NL-21. This is a low quality, class 2 instrument with a stated noise floor of just under 20 dB(A). No specific data on the actual instrument noise floor, accuracy or calibration is provided.

This means that any actual noise below 20 dB(A) will be masked by the internal interference within the SLM. As a result, a true indication of the background noise level cannot be achieved and the quoted results will considerably overstate the actual background noise level.

In addition, Sonus have combined both day and night-time background noise results in the one graph. The policy has different noise limits for both. Combining day and night time levels has the effect of understating the actual day-time noise levels and overstating the night-time noise levels. The night-time noise levels are what cause most annoyance.

Neoen have provided no data on the SODAR unit apparently used to measure wind speeds at equivalent turbine heights. Given the poor correlation presented, this is a likely source of error.

As required by the Noise Policy, the instrumentation used must accurately record and analyse the complete range of noise present in the environment.

Recommended Action: Neoen must be directed to conduct new background noise monitoring with a more accurate instrument that has a noise floor below the actual noise levels at each location.

Additional References: Appendix 3 – Background Noise

2.6 Background Noise Results

Neoen Ref: Vol.2, p186, Section 8.1

> *"The background noise was measured using Rion "NL-21" (Type 2) sound level meters, all of which have a noise floor less than 20dB(A)."*

Neoen Ref: Vol.2, p199, Appendix C - The appendix contains background noise regression curves for the five locations – see Figure 2 above.

Ref: Section 3 of the Wind farms environmental noise guidelines 2009

> *"Background noise is measured at relevant receiver locations at continuous 10-minute intervals and particularly over the range of wind speeds at which the WTGs operate. The data must adequately represent conditions at the site and cover approximately 2,000 intervals."*
>
> *"This graph is then used in conjunction with the predicted noise levels to assess whether the wind farm will meet the criteria of these guidelines."*

Variation: The R^2 values for the five correlation curves presented as background noise are all in the range 0.1% to 14.9%. This indicates a very poor correlation between noise levels and wind speed. The guidelines include a 'typical' correlation graph for comparison; it has an R^2 value of 73.8%. This would be the minimum level of correlation required to provide a good degree of confidence in the results.

The R^2 values achieved for the background noise correlation curves indicate that the expected relationship between noise levels and wind speed has not been established as required.

There are many potential sources of error (Appendix 3) that could explain the poor correlation, yet Sonus has not identified the poor correlation and has not provided any reasons for the poor result. From a technical point of view, these correlation curves fail to deliver any relevant or useful information.

Recommended Action: Neoen must be directed to conduct new background noise monitoring with a more accurate instrument and a more effective methodology that results an acceptable correlation between background noise and wind speed.

Additional References: Appendix 3 – Background Noise

2.7 Background Noise Monitoring Locations

Neoen Ref: Vol.2, p186, Section 8.1

> *"The background noise monitoring was conducted in accordance with the 2009 Guidelines."*
>
> *"The monitoring locations are summarised in Table 6."*

Neoen Ref: Vol.2, p190, Section 8.5

"The maximum noise levels from the wind farm are compared with the corresponding noise criterion at each residence in Table 10."

Variance: Section 12 of the Environmental Protection (Noise) Policy 2007 defines noise affected premises and measurement places as follows:

"(1) For the purposes of this policy, measurements to determine the compliance with this policy of noise from a noise source are to be taken in relation to premises at which the noise is audible (noise-affected premises)...

(2) The measurement of a source noise level (continuous) and, subject to clause 15, an ambient noise level (continuous) or background noise level must be taken..."

The predicted noise will be audible at most of the residences in Table 10 of the Sonus report. Of the 80 residences in Table 10 where the WTG noise is likely to be audible, background noise measurements were only taken at 5 locations (6%) and 2 of those were at beneficiary residences. In addition, only 1 location is downwind of the dominant southerly wind direction, and this is a beneficiary property over 2km away.

A notable absence from the list of residences were the 3 closest uninvolved residences (H17, H24 and H51). All residences formally requested background noise measurements, but Neoen denied their requests.

Neoen are fully aware of the fact that without complete background noise levels at each impacted residence, it will be impossible to later prove the impact of the WTGs on their soundscape. Once operational, Neoen is unlikely to agree to turning off all WTGs to allow additional background noise monitoring. If the measurements are not done now, they never will be.

Recommended Action: Once the problems with the background measurement methodology are corrected, Neoen must be directed to conduct background noise measurements at all residences where the WTG noise is likely to be audible.

In the unlikely event that this development application is approved, achievement of complete and independently verified background noise measurements should be a prerequisite condition to starting construction.

Additional References: Appendix 3 – Background Noise

2.8 Sound Power Data

Ref: Section 3.3 of the wind farms environmental noise guidelines 2009 requires the developer to provide sound power data for the proposed WTG for the wind farm.

"Sound power level data at wind speeds from cut-in speed to the speed at rated power and each integer speed in between as determined in accordance with the International Electrotechnical Standard IEC 61400-11."

Ref: Section 3.4 of the wind farms environmental noise guideline:

> *"The predicted noise level should be overlaid on such a graph to determine compliance with the criteria."*

Variance: Sonus have only provided sound power data for one set of undefined conditions. The test conditions and compliance certificates are not provided. In addition, the predicted noise levels are not overlaid on the regression graphs.

Without reliable WTG noise data at each increment of wind speed, it is impossible to overlay the predicted noise levels on the background noise regression graphs. Therefore, a true indication of the impact of the development is not possible.

Neoen's spacing of the WTGs is much closer than manufacturers recommendation (3x vs 10x rotor dia.). As a result, it is highly likely that published sound power data will be exceeded under operational conditions. It is also highly likely, given the WTG spacing, that no manufacturer will warrant achievement of their published sound power levels.

Recommended Action: Neoen must provide incremental sound power data and once the identified problems with the regression graphs and prediction model are corrected, the noise predictions should be overlaid on the background noise regression graphs.

Additional References:

Appendix 1 - Noise Characteristics
Appendix 2 - Crystal Brook Wind Farm Noise Impact Assessment Commentary
Appendix 4 - WTG Sound Power Data

Appendix 2 contains independent commentary on the environmental noise assessment of the proposed wind farm. Plate 5 below is a representation of the likely noise profile from the WTGs. It is clear that there are many residents (Yellow dots) that will be significantly impacted by this development. It is also clear that most of the town of Crystal Brook will also be significantly impacted by the development. This impact is likely to include adverse health effects, nuisance and loss of visual amenity.

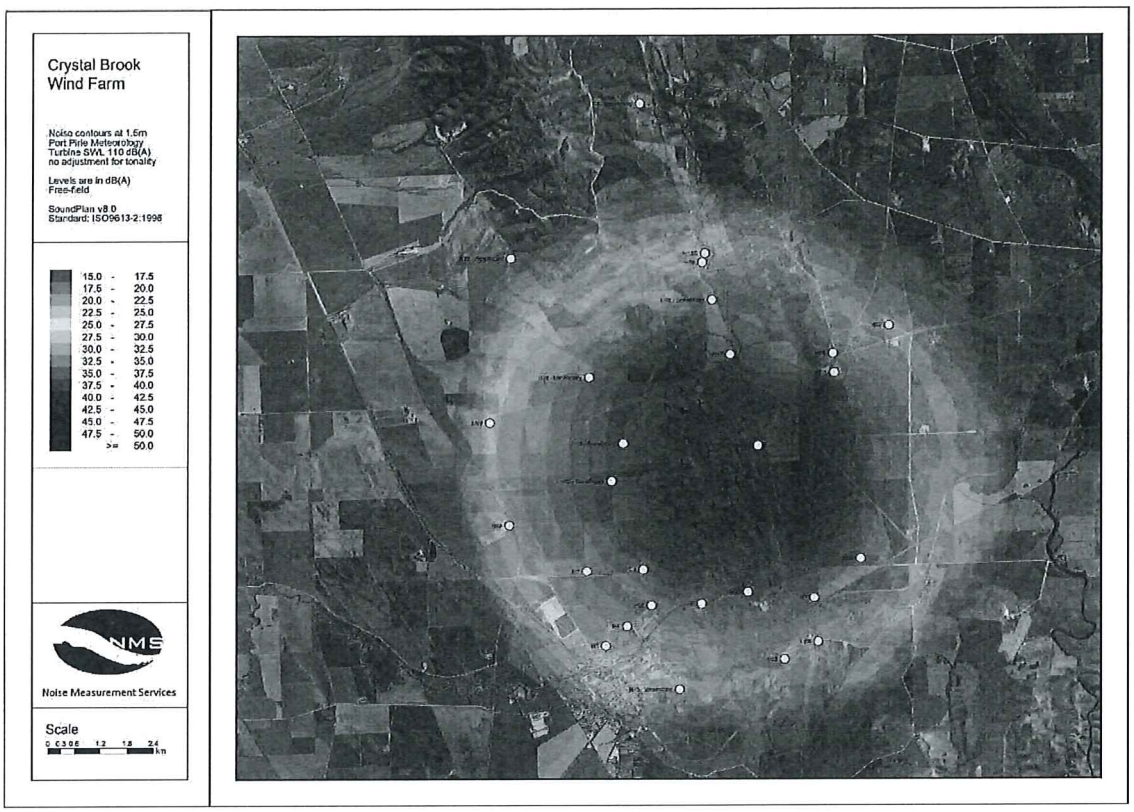


Figure 2 - Calculations with Port Pirie wind rose data, turbines at 110 dB(A) sound power level

There are many other obvious variances within the Neoen development application and the Sonus report. Unfortunately, I do not have the time to highlight them all. However, it is clear that their work is both inaccurate and incomplete and it clearly fails to meet the requirements of the Environment Protection (Noise) Policy 2007 or the Environment Protection Act 1993; therefore, also failing to meet development planning approval requirements.

In my opinion, their work as grossly inadequate and they have not provided adequate verifiable evidence to prove that this development will not result in serious environmental harm. Given recent research evidence regarding the human health impacts from wind turbines, such proof was never possible.

Neoen and Sonus should be referred to the EPA and a truly independent assessment of their submission to determine whether they have in fact committed a breach under Section 34 of the Environment Protection Act 1993.

3. Adverse Health Impacts

Throughout their community consultation and within their development application (Ref.5, p85 of 140), Neoen make the following claim:

> *"Regarding infrasound, there is no scientific data to suggest that the levels of low frequency noise emitted by wind turbines make humans sick. Research to date has not shown any negative health effects at the noise levels produced by operational wind turbines."*

This statement is absolutely *false and misleading*!

Beetaloo Valley residents asked several specific questions of Neoen at a public meeting on 9 February 2017; including a question regarding WTG noise impacts on human health. The Neoen response to those questions is included in Appendix 5. Neoen's specific response to the question of human health effects stated:

> *"A thorough review of research literature conducted by Australia's National Health and Medical Research Council (accessible at https://www.nhmrc.gov.au/guidelines-publications/eh57) has concluded that there is no published evidence to link wind turbines with adverse health effects. Other studies by leading health and research organisations, including the World Health Organisation and the UK Health Protection Agency, support this conclusion (accessible at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335014/RCE-14_for_web_with_security.pdf; http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf?ua=1)."*

The NHMRC did no research, only a literature search and their actual quote states:

> *"...there is currently no consistent evidence....."*

There is a significant difference in these two statements. The NHMRC defined 'consistent' as meeting their rigorous research quality criteria. As with many new learnings, the absence of evidence is not evidence of absence! We must also remember that the NHMRC report was based on research that, in many instances, is now more than 25 years old.

In fact, the NHMRC indicated that there is sufficient prima facie evidence to suggest a possible link between wind farms and human health.

> *"Given these reported experiences and the limited reliable evidence, NHMRC considers that further, higher quality, research is warranted."*

The UK Health Protection Agency report (RCE-14) referenced by Neoen was published in 2010, is also out of date and uses similar language to the NMHRC report:

> *"There is no consistent evidence of any physiological or behavioural effect of acute exposure to infrasound in humans. There is, however, little good quality research and interpretation is complicated because low frequency noise often includes audible as well as infrasonic frequencies.*

At high levels of infrasound, aural pain and eardrum rupture can occur. There have been few studies on longer-term effects of infrasound in humans....."

The WHO has recognised the growing body of research over the last few years and is currently updating its environmental noise guidelines. Indications are that the updated guideline will include infrasound, low frequency noise and vibration. An excerpt from a WHO media release follows:

"The European office of the World Health Organisation (WHO) is in the process of developing Environmental Noise Guidelines for the European Region as a regional update to the WHO Community Noise Guidelines.

The new Guidelines will be based upon a review of evidence of the health effects of environmental noise in the light of significant research carried out in the last few years.

For the first time the panel is investigating adverse health issues in local residents following the construction of wind turbines, the health benefits of noise mitigation and possible government intervention to decrease noise levels.

It will look at adverse affects such as: sleep disturbance, annoyance, cognitive impairment, mental health and wellbeing, cardiovascular diseases, hearing impairment and tinnitus and adverse birth outcomes."

There are several thousand research papers and complaints from impacted residents to support the assertion of human health effects from wind turbines, and to date there has not been even one paper that proves the absence of any impact. All the reports and statements from the NHMRC, UK Health Protection Agency and WHO reference a significant volume of research that has established a human health effect from wind turbines.

Neoen has consistently and knowingly mis-quoted and mis-represented scientific reports to further their own interests. Section 136.1 of the Criminal Code Act 1995 (Australia) states:

"A person is guilty of an offence if:

(a) the person makes a statement (whether orally, in a document or in any other way); and

(b) the person does so knowing that the statement:

(i) is false or misleading; or

(ii) omits any matter or thing without which the statement is misleading

Whether there is evidence that wind farm emissions cause or are associated with diseases, and, whether there is a plausible basis for thinking that wind farm emissions could lead to disease has recently been considered in the case: Waubra Foundation and Commissioner of Australian Charities

and Not-for-profits Commission [2017] AATA 2424 (4 December 2017). The Tribunal consisted of the ***Honourable Justice White, Deputy President and Deputy President K Bean***.

The official link to the AAT decision on the Austlii website is: http://www.austlii.edu.au/cgi-bin/viewdoc/au/cases/cth/AATA/2017/2424.html

The section of the judgment dealing with wind turbine noise being a pathway to disease are summarised in the following excerpts from pages 141 to 148 of the AAT decision:

> *"**468.** The propositions which we understand have unanimous support from the relevant experts or are not contested include the following:*
>
> - *Wind turbines emit sound, some of which is audible, and some of which is inaudible (infrasound);*
> - *There are numerous recorded instances of WTN exceeding 40 dB(A) (which is a recognised threshold for annoyance/sleep disturbance);*
> - *There are also recorded instances of substantial increases in sound at particular frequencies when particular wind farms are operating compared with those at times when they are shut down;*
> - *If it is present at high enough levels, low frequency sound and even infrasound may be audible;*
> - *WTN is complex, highly variable and has unique characteristics;*
> - *The amount and type of sound emitted by a wind farm at a given time and in a given location is influenced by many variables including topography, temperature, wind speed, the type of wind turbines, the extent to which they are maintained, the number of turbines, and their mode of operation;*
> - *Wind farms potentially operate 24 hours a day, seven days a week;*
> - *There are numerous examples of WTN giving rise to complaints of annoyance from nearby residents, both in Australia and overseas.*
>
> ***469.** The propositions which are supported by the preponderance of relevant expert opinion, and which we accept on that basis, include the following:*
>
> - *A significant proportion of the sound emitted by wind turbines is in the lower frequency range, i.e. below 20 Hz;*

- *The dB(A) weighting system is not designed to measure that sound, and is not an appropriate way of measuring it;*
- *The most accurate way of determining the level and type of sound present at a particular location is to measure the sound at that location;*
- *The best way of accurately measuring WTN at a particular location is through 'raw' unweighted measurements which are not averaged across time and are then subjected to detailed "narrow-band" analysis;*
- *When it is present, due to its particular characteristics, low frequency noise and infrasound can be greater indoors than outdoors at the same location, and can cause a building to vibrate, resulting in resonance;*
- *Humans are more sensitive to low frequency sound, and it can therefore cause greater annoyance than higher frequency sound;*
- *Even if it is not audible, low frequency noise and infrasound may have other effects on the human body, which are not mediated by hearing but also not fully understood. Those effects may include motion-sickness-like symptoms, vertigo, and tinnitus-like symptoms. However, the material before us does not include any study which has explored a possible connection between such symptoms and wind turbine emissions in a particular population.*

470. *We consider that the evidence justifies the following conclusions:*

- *The proposition that sound emissions from wind farms directly cause any adverse health effects which could be regarded as a "disease" for the purposes of the ACNC Act is not established;*
- *Nor, on the current evidence, is there any plausible basis for concluding that wind farm emissions may directly cause any disease;*
- *However, noise annoyance is a plausible pathway to disease;*
- *There is an established association between WTN annoyance and adverse health effects (eg. this was established by the Health Canada study);*
- *There is an established association between noise annoyance and some diseases, including hypertension and cardiovascular disease, possibly mediated in part by disturbed sleep and/or psychological stress/distress;*
- *There are as yet no comprehensive studies which have combined objective health measurements with actual sound measurements in order to determine for a given population the relationships between the sound emissions of wind turbines, annoyance, and adverse health outcomes. Indeed there is as yet no study which has given rise to a soundly*

based understanding of the degree to which particular types or levels of wind turbine emissions give rise to annoyance, or what levels or types of emissions are associated with what level of annoyance in the population. Because it relied on calculated rather than actual sound measurements, and was limited to the A and C-weighted systems, the Health Canada study did not do this.

473. *The applicant submitted that the evidence in the hearing provided plausible and credible evidence of the kind required. Counsel referred in particular to the effect of noise on sleep and, in particular, in disturbing sleep. It was not contentious that impaired sleep, if sufficiently serious, may result in a number of ailments and diseases. Professor Wittert said that "depression and sleep disturbance are, respectively, the first and third most common psychological reasons for patient encounters in general practice". The professor went on to say that insomnia doubles the risk of future development of depression and that insomnia symptoms together with shortened sleep are associated with hypertension. Professor Wittert also said that a person suffering from restricted sleep is exposed to an increased risk of elevated blood sugar levels and endocrine disorders such as diabetes, symptomatic ischaemic heart disease, hypertension, obesity, insomnia and anxiety related illnesses.*

476. *As our earlier findings have indicated, some wind farms generate sound which is capable of causing, and does cause, annoyance. We are further satisfied that annoyance of the kind which is generated (often associated with psychological distress and sleep disturbance), is a recognised pathway to a range of adverse health outcomes, including hypertension and cardiovascular disease.*

481. *It follows in our view that the applicant has established that there is a plausible basis for thinking that wind turbine sound (mediated by annoyance) may lead to adverse health outcomes, such as to warrant further investigation. It is unnecessary for us to draw conclusions as to the precise nature of the annoyance which is caused, and whether annoyance may be caused by sound which is not audible (infrasound). That is something which we expect will be the subject of further study and investigation. For our purposes, it is sufficient that annoyance is produced, and it appears that it may be associated with adverse health outcomes. An identification of the causes of that annoyance may allow it to be reduced or mitigated and adverse health outcomes to be reduced or avoided.*

482. *We regard it as particularly significant that the NHMRC has considered that, despite the absence of direct evidence that exposure to wind farm noise affects physical or mental health, and the poor quality direct evidence that wind farm noise is associated with annoyance or sleep disturbance, it is appropriate to provide funding to the extent of $3.3 million for an evaluation of the "sleep and physiological disturbance characteristics of wind farm noise compared to traffic noise" and for an investigation of whether "exposure to infrasound causes health problems". Given this degree of recognition by the NHMRC, we do not consider that it should be held that the associations which are the subject of the applicant's activities do not have plausibility or credibility, although not as yet positively established.*

485. *Given our finding that there is a plausible basis for considering that wind farm sound emissions may have an adverse effect on human health, we accept that conducting, supporting and advocating for further research or engaging in awareness raising activities could be properly characterised as activities promoting the prevention or control of diseases (in the sense of that term explained earlier)."*

Until now, the only piece of the puzzle preventing researchers from completely quantifying the human health effects was identifying the impact mechanism. As a result of research during, and following, the Cape Bridgewater study, the mechanisms for human health impact have now been identified, proven and published[11]. Wind farm proponents, medical societies, acoustical societies and Government agencies are all aware of the facts. All we need now is for regulators to act.

4. General Environmental Duty, Code of Ethics and Potential Fraud

There are thousands of wind turbines impacting hundreds of communities in Australia and overseas and there are no 'good news' stories from any of them. Australians are being harmed physically, psychologically and financially by wind farm proponents; all with the blessing of Government.

In addition to the empirical evidence reported by the many impacted residents, there is also a growing body of peer-reviewed research evidence verifying the negative impacts of wind turbines on individuals. Neoen and other wind industry proponents have known of the negative health impacts of low frequency noise for decades.

Like the tobacco industry before it, the wind industry has spent decades vehemently denying known harmful consequences associated with its product, while promoting its fraudulent feel-good image. Dismissing or denying the serious health impacts of industrial-scale wind turbines is wishful thinking, akin to insisting that tobacco is harmless because we enjoy it.

Infrasound (inaudible) and low-frequency (audible) noise (also known as ILFN) produced by industrial-scale wind turbine generators (WTGs) directly and predictably cause adverse human health effects. The sonic radiation tends to be amplified within structures, and sensitivity to the impact of the resonance increases with continuing exposure.

These facts have been known to the wind industry and the US Government since the 1980s when it became a 'hot topic', with numerous studies presented and published by acousticians working under grants from the Departments of Energy, Defence and NASA. The wind industry response? Deny the science; insist that "what you can't hear can't hurt you". Claim that "neighbours will get used to it". Not a surprising response given the millions of dollars at stake.

Since those early studies, the wind industry has done a magnificent job of influencing regulators and having these critical aspects of WTG noise excluded from legislation, codes, standards and guidelines. For example, current South Australia wind farms environmental noise guidelines only require noise measurements to be taken outside dwellings and only in dB(A); a heavily filtered scale that reflects the relative loudness as perceived by the human ear; while drastically reducing sound-level readings in the lower frequencies that are known to cause human health problems. This is akin to claiming that because we can't see infrared and ultra violet radiation, they won't harm us.

From a distance, many view the massive turbines as majestic – as a clean, seemingly quiet and free source of endless energy. However, to untold thousands of families clustered within 10 kilometres of the pulsing machines, the WTGs bring a strangely debilitating illness – increasingly incapacitating for some; yet scoffed at by wind proponents.

Common sense tells us that a 240m tall structure with 80m long blades sweeping an area 3 times that of a football field and moving at over 300 kph at their tips will negatively impact quiet neighbourhoods. But the extent and severity of the WTGs effect on body, mind and spirit comes as a surprise to most people.

The primary pathway of turbine assault on human health is no mystery. The Israeli army has used low-frequency sound pulses as high-tech crowd control for years. People are made nauseous and confused, with blurred vision, vertigo, headaches, tachycardia, heightened blood pressure, pain and ringing in the ears, difficulties with memory and concentration, anxiety, depression, irritability, and panic attacks.

This also describes the Wind Turbine Syndrome (WTS), a constellation of symptoms first given a name by the brilliant young MD/PhD, Nina Pierpont. She followed her astute and compassionate observations of turbine neighbours around the world with epidemiological research, using a robust case-crossover statistical design: *"subjects experienced symptoms that varied with proximity to the turbines"*. When the same subjects were placed at a greater distance from the turbines, their symptoms abated; returning when they were bought back to the scene.

Michigan State University noise engineers explain that *"Inaudible components [ILFN] can induce resonant vibration in liquids, gases and solids … bodily tissues and cavities – potentially harmful to humans"*. A resident in the ground-breaking Steven Cooper lead Cape Bridgewater study described how the resonance showed up in a glass of water on her kitchen table, and in the toilet bowl, and how she felt it in her body.

Coopers key findings from the Cape Bridgewater study[10] include the following:

- *Noise measurements in dBA represent audible sound only; and do not include any measurement of infrasound. However, by using sound meters that can measure infrasound and recording the infrasound levels in narrow (one tenth of an octave) frequency bands it was clear that infrasound was present in the three homes.*

- *Wind turbines emit a recognisable and repeatable sound signature (or profile), being the relationship between power level in dB and frequency across the full frequency spectrum. This signature, whilst it contains significant energy in the infrasound range, is in no way comparable to other sources of infrasound such as waves on the beach, other fast rotating machinery, refrigerators, trains, road traffic, etc. as claimed by wind industry "experts" and sundry acolytes. The signature is now identified as dB(WTS).*

- *The intensity of the infrasound levels inside the houses varied between and within rooms (probably due to resonance), but was often present at levels known to be dangerous to humans and to trigger a flight response in the startle reflex centre of the brain. A potentially causative energy problem is identified in each of the three houses.*

- *It was determined from early testing that recording of impacts solely by the previously used parameters of noise and vibration was not enough. A third impact being "sensation" needed to be added to cover, as it transpired, the reaction of the body to infrasound.*

- *Diaries[15] used by the South Australian EPA at the Waterloo project, which did not include sensation, were not competent to produce the necessary evidence. In my opinion, the EPA's conclusions in that study were wrong and therefore irrelevant. The form of the Cape Bridgewater diaries must be the minimum standard for future investigations.*

- *Since measurements in dB(A) and predictive noise models for turbines being expressed in dB(A) exclude infrasound, it follows that dB(A) is useless as a proxy for predicting damage on neighbours, or for setting standards to protect them from harm.*

Even before Cooper's investigation the noise standards were known to be useless. Responsible authorities should have altered the standards to include sound as a whole and infrasound in particular. Cooper's work reinforces the need for urgent revision. These standards must never be used again. They are both meaningless and dangerous.

Since the Cape Bridgewater study, Steven Cooper and others have continued this line of research and in 2015 Cooper gave expert testimony[5] to the Select Committee on Wind Turbines. Cooper's submission included the following statements:

- *Infrasound has long been known to be dangerous and harmful to humans, especially with chronic exposure. Infrasound persists for much greater distances than audible sound and, unlike audible sound, penetrates virtually all building structures (including double glazing) with ease; and often increases the impact by resonating with internal structures in the house.*

- *Standards in Australia for wind turbine noise are set in audible decibels dB(A) outside houses. The standards do not require infrasound (either within or without dwellings) to be predicted and considered in planning submissions nor to be measured in the required compliance testing for the planning permit noise conditions.*

- *Wind turbines produce infrasound along with audible noise. The larger the turbine the larger the proportion of infrasound. Most turbines are now larger than 4 MW, compared to 2 MW at Cape Bridgewater where wind turbine infrasound has been identified at dangerous levels inside homes.*

Note: The WTGs proposed by Neoen are more than double the size of the Cape Bridgewater WTGs, yet there is no evidence presented by Neoen to prove they are safe.

- *Placing turbines closer together than the manufacturers' recommended separation distances of 10 x rotor diameter causes a higher proportion of the exiting turbulent wind from one turbine to enter the next turbines. Turbines are designed to extract energy from wind in streamline flow; dealing with incoming turbulent flow increases the percentage of infrasound and places greater mechanical stress on the turbines.*

Note: The average spacing of the proposed Neoen WTGs is only just over 3 x rotor diameter. Being so close together, many will undoubtedly be operating within the turbulent exhaust of other turbines. This will clearly decrease turbine blade efficiency and significantly increase noise levels above manufacturers published values; that are determined under streamlined air flow conditions. It is unlikely that any WTG manufacturer will warrant published sound power levels where turbine spacing is less that specified.

Sonus have conveniently omitted any reference to this and other impacts in their environmental noise assessment prepared for the Neoen development application. This is despite the fact that they reported on these very issues to the Clean Energy Council in 2010 (Appendix 7).

- *By the use of different sound meters and by measuring sound in narrow (frequency) bands it is quite possible to isolate and measure infrasound from wind turbines.*

- *Substantial numbers of residents living in once quiet environments and now living within 10km of turbines, have suffered, and are still suffering, severe impacts since the turbines started operating. Many have left their homes to live in greatly diminished circumstances, as their houses are no longer habitable or saleable. Some become unable to work or study.*

Note: The town boundary of Crystal Brook is just over 2km from the closest WTG and the town centre is only 4.5km away. The township of Gladstone is within 10km. Potentially thousands of South Australian residents will be impacted by the harmful noise generated by these WTGs.

- *Wind projects involve very large sums of money in construction, in revenues and in public subsidies. It is not uncommon to find companies with large investments and large cash flows going to great and even improper lengths to maintain their cash flows.*

- *The wind industry has never been asked to prove that their machines are safe. When queries are raised about impacts on neighbours, the industry and its acolytes trigger the "Four Ds" of denial, dissemble, delay and destroy (the messenger).*

As turbine size increases, the sickening ILFN emissions worsen. There is a lot of money riding on keeping the science under the radar of public awareness, and regulations to a minimum.

When Denmark's EPA proposed tightening turbine noise regulations to protect turbine neighbours from increasing ILFN (May 2011), the Vestas CEO wrote to the DEPA Minister, asserting:

> *"It simply isn't technically possible to curtail the ILFN output",* and *"Increased distance requirements [setbacks from residences] cannot be met whilst maintaining a satisfactory business outcome for the investor".*

DEPA folded, turning instead to looser standards that were *"likely to be copied by other countries".*

Australia is not immune to the corruption. In his renewable energy speech to the Senate on 15 September 2015, Senator John Madigan spoke of corruption and fraud within the acoustics industry where reports to compliance regulators are being falsified to maintain 'licence to operate'. Senator Madigan went on to summarise the impacts on residents:

> *"While ACCIONA and Pacific Hydro were busy breaching their permits to maximise their profits, residents were and still are often exposed to horrendously excessive noise. Twenty or more of these same people had sent affidavits to former health minister and current Victorian Premier Daniel Andrews in June 2010. They reported severe sleep disturbances and a series of unexplained adverse health effects that were not present before the wind farms started operating. Local doctors and a sleep specialist confirmed concerns of a correlation."*

> *"The nocebo theory is obliterated by the fact that the noise measured at Waubra and Cape Bridgewater exceeds World Health Organisation recommendations for sleep protection. Sleep deprivation is an indisputable health effect. Even the NHMRC now admits there are probably adverse health impacts for residents living within 1.5 kilometres of a wind turbine."*

Repetitive sleep disturbance and stress-related symptoms are the most common health complaints of WTG neighbours. The audible sound constantly fluctuates, described as akin to low-flying jets or the rumble of helicopters, "freakish, screeching sound sludge." It is unnatural. People say the noise gets into your head, and you can't get it out.

Advising the Falmouth, MA Board of Health, Dr. William Hallstein wrote:

> *"All varieties of illnesses are destabilised, secondary to inadequate sleep: diabetic blood sugars, cardiac rhythms, migraines, tissue healing. Psychiatric problems intensify … all in the 'normal' brain. Errors in judgment and accident rates increase".*

As with seasickness, not everyone is similarly affected. But for many, the experience becomes literally intolerable. Devastated families and individuals around the world, having lost their health, jobs or farms, return their keys to the bank, sell their homes at fire-sale prices, or simply pack up and flee. Some never recover their health.

The continuing expansion of Big Wind is a tale of money and power shunting aside integrity and compassion, abetted by a disinterested news media, leading to an un-informed public, further betrayed by "human rights advocates" loathe to break ranks from popular positions.

The myth that "saving the world" requires tolerating the costs of Big Wind could not be further from the truth. Responsible stewardship demands critical thinking, common sense and grade school science, not just following Big Wind's Pied Piper and supposedly good intentions.

In fact, allowing wind into the energy mix squanders our non-renewable environment and taxpayer billions that are greatly needed elsewhere, wasting them on the most idiotic of engineering conceits.

Reliance on wind actually increases emissions and fossil fuel use overall, due to inefficiencies introduced into the system. Big Wind eliminates none of the need for conventional capacity, but rather consumes vast quantities of additional fuel and raw materials, while spewing emissions during the manufacture, transportation, construction and maintenance of the enormous redundant turbines and their uniquely demanding infrastructure.

The Wind Game is nothing but an obscenely costly, mostly useless energy redundancy scheme. It funnels unimaginable profits from our taxpayer and rate-payer pockets to its inner circle, while knowingly ignoring its victims' desperate pleas for relief – and indeed, ridiculing them and trying to bury the growing body of evidence proving harm to their health and wellbeing.

We've witnessed three decades of this callous, mercenary assault, this arrogant denial of what is known to be true, this untold suffering of thousands of innocent victims around the world. It's time to bring in the human rights and social justice referees – and call 'game over'.

5. Bushfire Risk

Developers often claim that their technology is safe, and whenever there has been a wind turbine fire, or other form of serious accident, the developer is often quick to state that this is a rare occurrence. Yet you only have to look at insurers reports to get a better understanding of accident rates and insurance claims made by wind energy developers to get a truer account of the health and safety aspect of turbines. In addition, the internet is teaming with examples[14] of WTGs engulfed in flames and throwing burning debris into the surrounding countryside.

According to the IMIA Insurance of Wind Turbines report, a report that was compiled based on 15 years of the Wind Energy industry in Danish markets; Mechanical faults (blade failure and other faults) accounted for 40% of claims, Lightning accounted for 20% of claims, Fire accounted for 7% of claims, Storm accounted for 4% of claims, Liability for 0.5% of claims, and Others (LOP, short circuit, etc.) accounted for 28.5% of claims.

On 11 December 2011 the Daily Telegraph reported that RenewableUK confirmed that there had been 1,500 wind turbine accidents and incidents in the UK alone in the past 5 years.

Caithness Wind Farms have compiled a detailed report on wind farm accidents throughout the UK and Internationally, by sourcing news articles, accident reports and insurance documents. They state that:

"Fire is the second most common accident cause in incidents found. Fire can arise from a number of sources – and some turbine types seem more prone to fire than others. A total of 185 fire incidents were found."

The biggest problem with wind turbine fires is that, because of the turbine height, the fire brigade can do little but watch it burn itself out. While this may be acceptable in reasonably still conditions, in a storm it means burning debris being scattered over a wide area, with obvious consequences. In dry weather there is obviously a wider-area fire risk, especially for those constructed in or close to forest areas and/or close to housing or work places.

There have been three wind turbine fires reported in South Australia – Lake Bonney (2006), Cathedral Rocks (2009) and Starfish Hill (2010). Scottish Engineers have reported that the actual number of fires may be up to 10 times the number reported by wind farm operators. The proposed Neoen wind turbines will be located in medium and high-risk bushfire areas. Globally, turbine nacelle fires are quite common, despite the false and misleading claims by Neoen.

In February 2017, Neoen was asked specific questions (Appendices 5 & 6) regarding increased fire risks and firefighting limitations created by operational WTGs. Excerpts from the Neoen development applications include:

"It is not anticipated that the Crystal Brook Energy Park will increase the risk of bushfires in the area."

"Wind farms are not considered to pose any special hazards when it comes to fighting fires from the air. Pilots view turbines as no different to other tall structures and hazards such as power lines, transmission towers, radio masts, mountains and valleys."

"Wind farms are just another piece of infrastructure in the environment that needs to be managed on a risk basis when fighting fires '

The link provided by Neoen to the CFS document on aerial firefighting limitations actually states the following:

"Vertical obstructions such as power lines, weather masts, radio and television transmission towers, tall trees and wind turbines close to a fire area may limit aerial firefighting operations. Where obstructions do exist, a dynamic risk assessment is undertaken by the pilot in command prior to aircraft being committed. In some circumstances aircraft will not be utilised because risks caused by vertical obstructions exceed safe operating conditions."

The aviation report generated by Hart Aviation for the Berrimal Wind Farm makes the following recommendations:

"Helicopter or fixed wing aircraft operations within the confines of any wind farm and below the top of the wind turbines are potentially hazardous and not recommended."

Aerial firefighters may treat wind turbines as they would any other tall structure; however, the size and density of this proposed development will have a significant impact on aerial access in the proximity of wind turbines. The proposed WTGs will be the tallest structures in South Australia.

Neoen's claim that this development will not increase risk is ludicrous and yet another example of their false and misleading statements. Introducing 26 x 4.8MW electrical generators, 240m high with 80m long blades rotating at over 300 kph will definitely increase the risk of fire and the risk to firefighters and the community.

The literature contains many examples of fires being initiated by turbine failures. Turbines contain significant volumes of highly flammable materials (Oils, GRP, etc.). As a result, turbines and the associated maintenance actions will introduce a significant additional fire risk to high and medium bushfire risk zones within the proposed development area. Neoen has failed to provide specific details on fire prevention and control measures to be installed in the WTGs and other facilities within these zones.

The CFS can't fight these fires and need to stand back beyond 1 kilometre and watch them burn because of flying debris. In addition, aerial firefighting in the vicinity of wind turbines is seriously restricted due to their height, air turbulence and aircraft instrument interference.

The proposed WTGs are essentially unmanned and even a small fire could quickly grow and involve a significant area before first respondents arrived. Do we really want to relive the 2014 Bangor fires?

6. Community Engagement

Neoen have dedicated many pages of their development application to lengthy explanations of their community consultation process. Whilst Neoen did undertake some community consultation, the reality is that it lacked integrity.

As an example, I was part of a group of concerned residents that met with Neoen executives on 9 February 2017. As an action from that meeting, Neoen committed to take on notice a number of questions and formally respond within a 'couple of weeks'. Neoen's response (Appendix 5) was received at the end of March 2017.

The response failed to answer a number of key questions and contained many obvious errors. To seek further clarification on Neoen's responses, a subsequent letter was sent to Neoen on 19 April 2017 (Appendix 6). The letter contained comments on Neoen's response to the February questions

and some additional questions. To date, despite many phone calls, emails and broken promises by Neoen, we are yet to receive a response.

Interestingly, many of the errors contained in the initial Neoen response have been duplicated in their development application. In my opinion, Neoen has not made a genuine attempt to consult and consider community concerns and has just put on a show so they could 'tick the box'. They have been quite arrogant in their approach to the community; with one Neoen executive actually acknowledging in a public meeting that they will emit wind turbine noise that could be harmful to neighbouring residents, but that was an acceptable price to pay for a successful project.

As people in the community have become more aware of the WTG issues and their concerns about the impacts have grown, many have approached Neoen with requests for background noise monitoring at their homes. Whilst most will be impacted by the turbines, Neoen continues to refuse their requests. Not exactly living the values of good corporate social responsibility!

7. Conclusion

I will refrain from commenting on Neoen's motives or duplicity in presenting so many false and misleading statements, errors and omissions in their development application; instead, I will leave it to the State Commission Assessment Panel to make those determinations. Regardless of the reasons, it is clear that Neoen's development application fails to present a complete and factual representation of the likely development impacts.

As such, Neoen has failed to discharge its 'General Environmental Duty' under Section 25 of the EPA Act 1993. Also, by not complying with all the requirements of the Environmental Protection (Noise) Policy 2007, Neoen and Sonus have intentionally or recklessly contravened mandatory provisions of the Environment Protection (Noise) Policy 2007 and have potentially committed an offence under Section 34 of the EPA Act 1993.

Even though recent research (<10 years old) has not yet flowed through into legislation, policy, standards, codes of practice and guidelines, the evidence of serious environmental harm from WTGs is irrefutable and in the public domain. I trust that, as accountable members of the State Commission Assessment Panel, you will have the foresight and courage to 'act in the public interests' by adopting a precautionary approach to these issues and recommending to the Minister that he should decline or defer approval of this development application until:

1. Neoen corrects the errors and omissions in their development application, and
2. Neoen reapply for Crown Sponsorship or resubmit as a Category 3 development, and
3. A proper assessment of the recent research findings can be undertaken by the EPA, NHMRC and other Agencies and more robust protection measures can be enacted in legislation.

Given the current body of knowledge, to proceed with this development, knowing it will create 'serious environmental harm', would be unethical.

The anecdotal evidence is overwhelming, the formal research evidence is irrefutable and in five years' time the cover-up of the deliberate harm to people will be public knowledge. What will this Panel be remembered for?

Given the number of concerned residents likely to make a personal representation to the State Commission Assessment Panel, I would request that hearings be held at an appropriate venue in Crystal Brook. This would also give panel members the opportunity to personally gauge the impact of the proposed development on the community.

Yours Sincerely

I.C.Peterson

Ian Peterson

References:

1. SA Environmental Protection Act 1993
2. SA Environmental Protection (Noise) Policy 2007
3. Port Pirie Regional Council Development Plan (Consolidated 31 October 2017)
4. Northern Areas Council Development Plan (Consolidated 12 February 2015)
5. SA Guidelines for the use of the Environmental Protection (Noise) Policy 2007
6. SA Wind farms environmental noise guidelines 2009
7. Neoen Development Application - 354_V003_18_Application_docs_Part_1
8. Neoen Development Application - 354_V003_18_Application_docs_Part_2
9. Crystal Brook Wind Farm Noise Impact Assessment Commentary – Noise Measurement Services (20 June 2018) – included as Appendix 2
10. The results of an acoustic testing program – Cape Bridgewater Wind Farm - Steven Cooper (The Acoustic Group) 2014
11. The Inaudible Soundscape of a Wind farm - Euronoise2018 Proceedings - Steven Cooper (The Acoustic Group)
12. Select Committee on Wind Turbines – Submission 387 – Attachment 1 (March 2015)
13. Wind Farm Technical Paper – Environmental Noise – Sonus (November 2010) – attached as Appendix 7
14. Turbines on Fire – Links: http://turbinesonfire.org/ and https://stopthesethings.com/?s=bushfire
15. Waterloo Wind Farm Environmental Noise Study – SA Environment Protection Authority (2013)

Appendices

Appendix 1	Noise Characteristics
Appendix 2	Crystal Brook Wind Farm Noise Impact Assessment Commentary
Appendix 3	Background Noise
Appendix 4	WTG Sound Power Data
Appendix 5	Neoen Response to BVA Meeting Questions
Appendix 6	Outstanding BVA Questions to Neoen
Appendix 7	Wind Farm Technical Paper – Environmental Noise – Sonus (November 2010)

Appendix 1 – Noise Characteristics

A noise characteristic is defined in the Environmental Protection (Noise) Policy 2007 (the Policy) as a tonal, impulsive, low frequency or modulating characteristic of the noise. The presence of a characteristic attracts a penalty under Clause 14(3). A penalty is applied because impulsive, low frequency, modulating or tonal dominated noise is more annoying than a constant, broad and steady noise.

Clause 14(3) of the policy defines the penalties as follows:

> *(3) If the noise from the noise source contains characteristics, the source noise level (continuous) must be further adjusted in the following way (except for the purposes of comparison with the background noise level plus 5 dB(A)):*
>
> > *(a) if the noise from the noise source contains 1 characteristic, 5 dB(A) must be added to the source noise level (continuous);*
> >
> > *(b) if the noise from the noise source contains 2 characteristics, 8 dB(A) must be added to the source noise level (continuous);*
> >
> > *(c) if the noise from the noise source contains 3 or 4 characteristics, 10 dB(A) must be added to the source noise level (continuous).*

Noise characteristics generally associated with WTG include tonality, low frequency and amplitude modulation. It is incumbent of the developer to prove that these characteristics will not be present.

The following sections define each of the noise characteristics and present evidence of their likely presence in the Neoen energy park development.

Amplitude Modulation

The sound level from rotating turbine blades is not completely steady, but is modulated (fluctuates) in a cycle of increased and then reduced level, sometimes called blade swish. Depending on the speed of the rotational speed and number of blades, this modulating noise typically occurrs at a frequency of around 1Hz. Depending on wind speed and the degree of turbulence, the modulation depth can increase to the point where it can become very pronounced and can give rise to increased annoyance during the day and disrupted sleep at night. This phenomenon is known as amplitude modulation of aerodynamic noise or more succinctly by the acronym AM.

The phenomena is well known to be associated with WTGs and is the single most significant source of reported adverse human health effects from WTGs. The use of full-spectrum time signals with an analysis of one third octaves in a waterfall plot to which then one observes the variation in the 1/3 octave bands over time[2] is a tool that clearly shows the presence of the dynamically pulsed amplitude modulation in wind turbines[1].

In December 2017, Dr. Sarah Laurie (Waubra Foundation), Dr BobThorne (Acoustar) and Mr Steven Cooper (The Acoustic Group) presented a paper at the Acoustical Society of America (ASA) conference in New Orleans. The trio presented conclusive evidence linking acoustic startle reflex and WTG sensitisation and disturbed REM sleep.

They presented the biological mechanisms that explain why health and sleep quality deteriorates with ongoing wind turbine exposure. Repeated stimulation of the startle reflex by a trigger (or triggers) leads to increasing wind turbine noise (WTN) sensitisation. If startle reflex occurs repeatedly during sleep, there is a downward spiral in physical and mental health, with poor quality and disrupted REM sleep at its core. Post traumatic stress disorder (PTSD) appears to one consequence of prolonged exposure for some people.

During the 2015, the Senate Select Committee on Wind Turbines, questioned Dr Geoffrey Leventhall on the health effects of wind turbines. Dr Leventhall is a UK-based, wind industry consultant.

The extract from the Official Hansard is reproduced below:

> **CHAIR:** What sort of research do you think is now required as a priority? Do you support the detailed investigation of the full acoustic spectrum inside affected residents' homes, together with concurrent physiological testing of their brainwaves, heart rate, blood pressure and stress biomarkers?
>
> **Dr Leventhall:** I think that the most important aspect of wind turbine noise—which I said in the paper I published nearly 10 years ago—is the amplitude modulation. Work is now developing on that, and I believe that that is where the main answer should be given, in amplitude modulation, because this is what upsets people. Personally, I do not believe that the infrasound and the low-frequency noise are an important problem, but because of the public and political pressure, it is inevitable that some work will be done on that. Work inside residences is obviously more important than work outside residences.

Conclusion:

Amplitude Modulation is present in WTGs and does have negative health effects. Therefore, it is reasonable to apply a noise characteristic penalty as defined by the Environmental Protection (Noise) Policy 2007.

References

[1] The Inaudible Soundscape of a Wind farm – Euronoise 2018 Proceedings – Steven Cooper

[2] Startle Reflex and Sensitisation – ASA Conference New Orleans, Laurie, Thorne & Cooper (December 2017)

[3] Wind Farm Technical Paper – Environmental Noise – Sonus (November 2010)

Tonality

A tonal characteristic can be identified objectively in accordance with the method in Australian Standard AS1055.1–1997 Acoustics—Description and measurement of environmental noise. The method involves comparing noise levels in adjacent one-third octave bands. The Australian Standard considers that a noise level in a one-third octave band that exceeds the level in each of the adjacent one-third octave bands by 5dB or more indicates the presence of a tonal characteristic.

Most of the sound power spectra in the Sonus report only report Octave frequency bands and are, therefore, not useful in determining tonality. However, the sound spectrum shown in Table 1 of the Sonus report contains 1/3 Octave sound power levels for the Solar Inverters.

The table below contains an extract of Table 1 from the Sonus report and shows the difference between adjacent 1/3 Octave bands. There are two clear tones centred on the 3,150Hz and 6,300Hz and the sound power levels are significant.

1/3 Octave Centre Frequency (Hz)	Sound Power Level (dB(A) re 1pW)	Difference in Sound Power (dB(A))
2,500	81	
		+10
3,150	91	Strong Tone
		-19
4,000	70	
		-1
5,000	69	
		+9
6,300	78	Strong Tone
		-9
8,000	69	

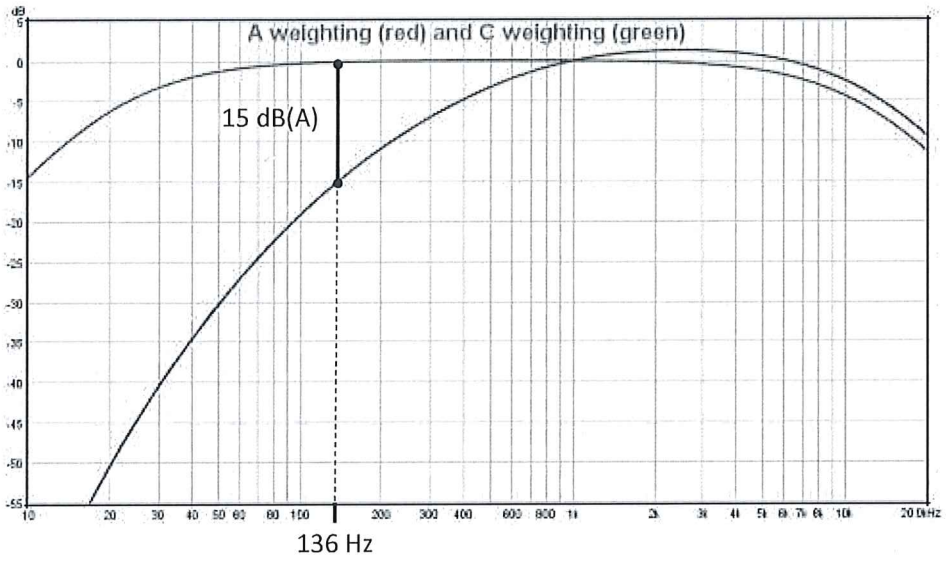
Conclusion:

Tonality is present in this equipment. Therefore, it is reasonable to apply a noise characteristic penalty as defined by the Environmental Protection (Noise) Policy 2007.

Low Frequency

The Guideline for use of the Environmental Protection (Noise) Policy states that an objective test to identify low frequency noise has not been established by an Australian Standard. However, such a test could comprise measuring and comparing 'A' and 'C' frequency weighted equivalent noise level results. A difference of 15dB or more is established in the New South Wales Industrial Noise Policy (1999) as a measure to establish the presence of a low frequency characteristic.

The difference between the two weighting systems is shown diagrammatically below:



The frequency at which the difference in noise level results exceeds 15dB is approximately 136Hz. Therefore, the presence of significant noise levels below 136Hz would be deemed low frequency.

All equipment, including the WTGs, proposed by Neoen for this development have significant sound power levels below 136Hz.

Conclusion:

Low Frequency is present in this equipment. Therefore, it is reasonable to apply a noise characteristic penalty as defined by the Environmental Protection (Noise) Policy 2007.

Summary

As three noise characteristics are highly probable, Clause 14(3)(c) requires an overall adjustment of 10dB(A) to be applied to the base for the criteria for development. This will result in a total adjustment of 15dB(A) to the noise source levels.

Appendix 2 – Noise Impact Assessment Commentary

Separate Attachment

Appendix 3 – Background Noise

Noise limits are defined in the EPA Noise Policy for both day and night-time periods. The night-time noise criteria is less than the day-time noise criteria because of the recognised negative impact of noise on sleep quality.

Therefore, noise assessments need to separately quantify predicted noise levels for both day and night-time periods. The method is defined in the wind farm environmental noise guidelines (the guideline).

The intent of the background noise analysis is to establish a baseline for the soundscape of the location prior to the installation of the WTGs. This is necessary for compliance monitoring and to determine whether there are any grounds for potential nuisance complaints once the WTGs are operational.

It is recognised that background noise can increase as wind speed increases and the guideline method seeks to establish the correlation between noise levels and wind speed.

Whilst the Sonus report suggests that the method has been applied diligently and presents a correlation graph for each of the five background noise locations, the outcomes presented as background noise are useless for the following reasons:

1. The sharp cut-off of noise below 20 dB(A) suggests that the actual noise level is below the 'noise floor', or minimum detection limit of the sound level meter (SLM) used for the background noise measurement. As stated in the Sonus report, the SLM used for the background noise measurement is a Rion NL-21. This is a low quality, class 2 instrument with a stated noise floor of just under 20 dB(A). This means that any actual noise below 20 dB(A) will be masked by the internal interference within the SLM. As a result, a true indication of the background noise level cannot be achieved and the quoted results will considerably overstate the actual background noise level.

2. Sonus have combined both day and night-time background noise results in the one graph. This has the effect of grossly understating the actual day-time noise levels and grossly overstating the night-time noise levels.

3. The correlation graphs contain a coefficient of determination (R^2), which is a statistical measure of how close the data are to the fitted regression line.

   Simply stated: R^2 = Explained variation / Total variation

   R^2 is always between 0% and 100%; where 0% indicates that the model explains none of the variability of the response data around its mean and 100% indicates that the model explains all the variability of the response data around its mean.

The R^2 values for the five correlation curves presented as background noise are all in the range 0.1% to 14.9%. This indicates a very poor correlation between noise levels and wind speed. The guidelines include a 'typical' correlation graph for comparison; it has an R2 value of 73.8%.

The reasons for the very low R^2 values could be due to the following:

1. High levels of noise not related to wind speed – eg machinery, vehicles, livestock, etc present during the noise monitoring period. Because Sonus did not record sound files, there is no way of identifying the source of high noise levels; therefore, it is almost certain that large quantities of extraneous noise data are included in the results.
2. Impact of rain on the microphone. Sonus claim to have removed noise data recorded during rain events, based on Bureau of Meteorology (BoM) rain observations. The nearest BoM weather stations are at Port Pirie, Snowtown and Yongala; 22km, 50km and 55km away, respectively, from the wind farm. Sonus have provided no specific information as to the source of the rainfall data. Given the large distance to either BoM weather station, it is almost certain that the weather conditions (rainfall) at the noise measurement sites were very different to that at the BoM weather stations. As a result, it is highly likely that large quantities of relevant data were removed from the analysis and large quantities of extraneous data included. Sonus has provided no evidence to support their claim that any extraneous noise data was removed.
3. Noise and wind readings taken at different times or isolated locations. Wind speed readings were not taken by Sonus; but provided by Neoen. Not date, time or GPS stamped data are provided by Neoen or Sonus to verify its validity.
4. Inaccuracies in the noise and wind measuring instruments. No calibration certificates are provided for either instrument.
5. Calculation errors. Neoen has not provided base data for independent verification.

Conclusion:

The background noise correlation graphs are of no value whatsoever and could not be used as a baseline for later determination of the additional impact of the WTGs on the soundscape.

A thorough analysis of the methodology and results should be undertaken to determine why such a poor correlation has been achieved and to separately report the day-time and night-time results.

Appendix 4 – WTG Sound Power Data

The wind farms environmental noise guidelines (the guidelines) require the developer to provide sound power data for the proposed WTG for the wind farm:

1. *Sound power level data at wind speeds from cut-in speed to the speed at rated power and each integer speed in between as determined in accordance with the International Electrotechnical Standard IEC 61400-11.*

This data has not been provided by Neoen or Sonus.

Sonus have provided a single sound power table (Table 9) for the representative GE 4.8-158 WTG. This single table represents a significant variance from the guideline requirements for the following reasons:

- The table is not validated by inclusion of a GE data sheet for this WTG.
- No test conditions for the claimed sound power levels are provided.
- The table does not contain sound power data at all expected WTG noise frequencies. There is significant sound power down to 1Hz generated by large WTG and this data is absent.
- The table presents data only in Octave frequency bands; therefor it is not possible to determine 'tonality' in accordance with IEC 61400-11. To determine tonality requires sound power levels to be presented in 1/3 Octave frequency bands.
- The table does not contain sound power levels for wind speeds from cut-in to maximum rated power.

The report fails to present the operating conditions and assumptions under which the WTG sound power levels were determined. For example, sound power levels will be significantly higher in the presence of turbulence that will be created by inadequate WTG separation distances. The manufactures of WTGs recommend minimum separation distances of 10 x rotor diameter. The Neoen wind farm has separation distances as small as 3 x rotor diameter. This will almost certainly create turbulent air flow to downwind turbines and result in much higher blade losses and increased levels of amplitude modulated noise.

Appendix 5 – Neoen Response to BVA Meeting Questions

neoen
renewing energy

Crystal Brook Energy Park Q&A

A. Response to questions taken on notice at meeting with Beetaloo Valley Association on 9 February 2017

No.	Question/Issue	Neoen Response
1.	Why has Neoen included a 1.5km setback from wind turbines to neighbouring residences?	The Crystal Brook Energy Park is located in both the Port Pirie Council and Northern Areas Council areas. Under the Port Pirie Regional Council Development Plan (10 January 2013) and the Northern Areas Council Development Plan (12 February 2015), the visual impacts of wind farms should be managed through wind turbine generators being setback at least 1km from non-involved dwellings and tourist accommodation, and 2km from defined and zoned township, settlement or urban areas. Neoen has included a larger buffer of 1.5km from non-involved dwellings and tourist accommodation in the design of the Crystal Brook Energy Park. This buffer is based on best practice having regard to the noise criteria in the South Australian Environment Protection Authority *Wind farms environmental noise guidelines* (2009).
2.	How does Neoen view health impacts from wind farms?	A thorough review of research literature conducted by Australia's National Health and Medical Research Council (accessible at https://www.nhmrc.gov.au/guidelines-publications/eh57) has concluded that there is no published evidence to link wind turbines with adverse health effects. Other studies by leading health and research organisations, including the World Health Organisation and the UK Health Protection Agency, support this conclusion (accessible at https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335014/RCE-14_for_web_with_security.pdf; http://www.euro.who.int/__data/assets/pdf_file/0017/43316/E92845.pdf?ua=1).
3.	Do wind turbines affect firefighting?	Part of the construction process of a wind farm involves building access tracks providing access to each wind turbine. These access tracks are an asset when it comes to fighting fires. In 2013, three grass fires occurred in close proximity to the Snowtown Wind Farm. In an article in the local paper, the 'Plains Producer', the CFS captain commented that the access tracks 'acted as a natural fire break', providing an edge to work back to and enabling back burning if necessary. This article can be found on page 8 of this response. Aerial water bombers can also be used near wind turbines. Earlier in 2017, a fire occurred near the Waterloo Wind Farm. As many as 200 CFS volunteers fought the fire, supported by three water bombing aircraft. A photo of a water bomber fighting the fire nearby wind turbines can be seen on page 7 of this response.

1

		The South Australian Country Fire Service (CFS) views wind turbines similarly to other vertical infrastructure such as power lines, radio and television transmission towers, or tall trees. The CFS website lists a number of factors that may potentially limit their ability to operate and/or their effectiveness during aerial firefighting operations (please see http://www.cfs.sa.gov.au/site/about/aerial_firefighting/aerial_firefighting_limitations.jsp). These include warm atmospheric conditions, strong winds, low visibility, flights at night, availability of ground support resources, or obstructions close to a fire such as power lines, weather masts, radio and television transmission towers, tall trees and wind turbines. Where obstructions do exist, a dynamic risk assessment is undertaken by the pilot.
4.	How long does it take for the output of wind and solar projects to offset the energy and resources used in the manufacturing and installation of these projects?	The time that it takes for the output of a wind or solar project to offset the energy and resources used up until it commences operation is often referred to as the "energy payback period". Studies on the energy payback period for wind turbines take into account the environmental impacts associated with their manufacture, installation, and end of life. Estimates of the energy payback period for wind turbines range from approximately 5 months (Martinez et al, 2009) or 6 months (Haapala and Prempreeda, 2014) to approximately one year (Crawford, 2009). Estimates for the energy payback period for solar PV vary depending on the type of photovoltaic systems used. Peng, Lu and Yang (2013) summarised a number of studies assessing the energy payback time for five different types of solar PV systems. The shortest estimate was 0.7 years, with the most conservative estimate being 12.1 years. Unless it is defined as a scheduled maintenance replacement component, the minimum design life for major plant at Crystal Brook Energy Park will be 25 years.
5.	Could the Beetaloo Valley Association select its own noise expert?	Neoen understands that noise is a key concern for the Beetaloo Valley Association. In South Australia, the Environment Protection Authority has developed specific guidelines for wind farms, the *Wind farms environmental noise guidelines* (2009). Neoen has commissioned Sonus, an independent acoustic consulting firm, to undertake noise monitoring at the Crystal Brook Energy Park site, and to prepare a Noise Report to be submitted as part of the Development Application. Neoen will share this Report with the Beetaloo Valley Association. Neoen is willing to fund an independent review against the guidelines by acoustic consultancy Marshall Day Acoustics of the Noise Report prepared by Sonus.
6.	Did Neoen continue the agreements that were signed between Origin and the landholders at the Crystal Brook Energy Park?	No. The original agreements between Origin and the involved landholders lapsed, and Neoen signed new agreements with the landholders. Neoen do not have copies of the original agreements signed with Origin.

7.	What is Neoen's contingency plan for any loss of TV or mobile phone reception caused by the project?	It is a priority for Neoen to ensure that landholders in the vicinity of the project are not affected by poor TV reception or mobile phone reception as a result of the project. Neoen will conduct both pre-construction and post-construction surveys of TV reception and mobile phone reception to determine any problem areas for reception. TV reception issues will be dealt with on a case-by-case basis to find the best solution for the residents involved, such as free installation of a higher performance TV aerial, or for phone coverage issues, subsidising switching to a different carrier with better coverage. Due to the proximity and orientation of the nearby TV transmitting, TV interference is not expected to be a significant issue for Crystal Brook Energy Park.
8.	What is Neoen's contingency plan for fire management?	Bushfire protection is a priority for Neoen. Neoen will consult with the Country Fire Service (CFS) throughout the life-cycle of the project. Prior to work commencing on the site, Neoen will prepare a Construction Environment Management Plan (CEMP), including a Bushfire Risk Management Plan. Neoen will also complete an Environmental Management and Monitoring Plan (EMMP) including a Bushfire Risk Management Plan for the construction and operation of the project. It is not unusual for a CEMP and EMMP to be required as conditions of development approval. Both plans were required as conditions of approval for the Hornsdale Wind Farm. The risk of a fire being started as a result of a wind turbine, solar panel or battery is remote. Lightning protection devices and temperature monitoring systems are installed on every wind turbine, and each turbine is situated next to a cleared construction pad. Storage units and control systems are designed to contain and isolate over-temperature in the event that one or a few cells overheat, and steel encasing around storage units protects storage facilities from external fires. On-site firefighting equipment, concrete bunds, and oil containment facilities, where required, will be present on site.
9.	Is the cumulative effect of other wind farms in the region taken into account in the visual assessment of the project?	The cumulative effect of other wind farms in the region will be assessed and taken into account as part of the project's Landscape and Visual Impact Assessment. The cumulative assessment will consider additional changes caused by the project in conjunction with other similar developments. The cumulative assessment will consider impacts on the character of the landscape as well as locations from where two or more developments may be visible from a single viewpoint. The assessment will also consider sequential effects (eg from roads) where an observer is moving from one viewpoint to another. The cumulative assessment will place an emphasis on potential significant effects rather than a determination of every conceivable effect that might occur.

10.	Which access roads does Neoen intend to use?	Neoen is yet to confirm the proposed access roads to be used at the Crystal Brook Energy Park. The consultancy GHD is preparing a Traffic and Transport Report which will assess the impact of the project on roads in the vicinity of the project area.
11.	How will Neoen utilise local contractors and materials at the Crystal Brook Energy Park?	Due to the size of the project, Neoen will enter into an Engineering, Procurement and Construction (EPC) contract with a head contractor. According to the latest construction update for the construction of Hornsdale Wind Farm Stage 2 (available here - http://hornsdalewindfarm.com.au/stage-2-january-construction-update/), 110,000 man hours have been worked on site, with an average of 118 people being present on site. While not all of these workers are locals, these workers spend money in local shops, restaurants, hotels and other services. The Hornsdale Wind Farm also employs locals from Jamestown, Clare, Port Pirie and Port Broughton on a permanent basis as part of the services team. The Crystal Brook Energy Park website invites anyone with skills that may be useful during the design, construction or operation of the energy park to email us at contact@crystalbrookenergypark.com.au with contact details and a brief summary of the services and skills they can provide. These details are being compiled in a list which will be provided to the EPC contractor. The EPC contract will stipulate a requirement to use local contractors wherever the required skills are available and cost competitive.
12.	Will Neoen commit to funding a study on the impact of the project on raptors?	Neoen commits to carrying out a raptor study.

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B. Response to key issues

No.	Question/Issue	Response
1.	Community feedback	• Neoen will submit a Community Consultation Report as part of the Development Application which will summarise the consultation activities undertaken, the key issues raised, and the project response to these issues. The Community Feedback Forms will be annexed to this report. • The issues raised by community members and other stakeholders will be taken into account by Neoen in developing the final project design.
2.	Visual	• Neoen acknowledges that the Crystal Brook Energy Park will have a visual impact on the project area. Neoen has engaged an independent consultant to conduct a Landscape and Visual Assessment of the Crystal Brook Energy Park site. • Neoen aims to work with the community in determining important viewpoints. We thank the Beetaloo Valley Association for taking the time to provide us with photos in order to prepare the four additional photomontages.
3.	Noise	• Neoen acknowledges that the Crystal Brook Energy Park will have an impact on noise in the vicinity of the project area. Neoen has engaged an independent acoustic consultant to conduct noise monitoring and prepare a Noise Report. This will be prepared in line with the SA Environment Protection Authority guidelines and SA planning rules. • Neoen invites members of the Beetaloo Valley Association to indicate whether they are interested in background noise monitoring being conducted at their houses. This monitoring will take place for 6 weeks. The data will be produced in the Noise Report submitted as part of the development application for the project. Preference will be given to houses closest to the project area, and we will select approximately 2-3 houses at which to conduct background noise monitoring.
4.	Property values	• Studies into the potential impact of wind farm developments on property prices, including by the NSW Valuer-General (2009) and Urbis (2016), have concluded that there is insufficient evidence to suggest that wind farms can be linked to adverse impacts on property prices. These studies are accessible at http://www.valuergeneral.nsw.gov.au/__data/assets/pdf_file/0006/195315/Preliminary_assessment_impact_of_wind_farms_on_surrounding_land_values_in_Australia.pdf; and http://www.planning.nsw.gov.au/~/media/Files/DPE/Reports/review-of-the-impact-of-wind-farms-on-property-values-urbis-2016-07-21.ashx.
5.	Health	• Please see response to question 2 in the table above.
6.	Fire	• Please see responses to questions 3 and 8 in the above table.

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7.	Ecology	• Neoen has engaged an independent consultant to conduct environmental surveys of the Crystal Brook Energy Park site. Neoen will take the feedback from the ecology consultants into account in determining the final project design so as to minimise ecological impacts.
8.	Local contractors	• Neoen is currently having discussions with manufacturers and sub-contractors around how more local contractors can be utilised in renewable energy projects.
9.	Benefits to broader community	• Neoen will create a Community Fund for the project to sponsor local projects, clubs and organisations. • Neoen welcomes feedback from the Beetaloo Valley Association on ways of neighbour benefit sharing. This was touched upon at the last meeting, however if there are any specific suggestions we would love to hear them.

http://www.adelaidenow.com.au/news/south-australia/bushfire-burning-out-of-control-in-mid-north/news-story/615e0cec8ee712a11db2a0f8e994bde2

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TRUSTPOWER WIND FARM NEWS ADVERTISING FEATURE www.trustpower.co.nz

Wind farm access roads aid firefighters

TrustPower

THREE grass fires in February, freakishly started by lightning – including one strike that killed a sheep – revealed a significant benefit brought by Snowtown wind farm access roads.

"They were absolutely of great benefit in helping us fight the fires," said Snowtown CFS captain, Pat Coffey. "It 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."

Landowner Neville Michael, whose farm is located just north of Barunga Gap and had about 25ha burnt out, says the upgrading of what had been rough and ready tracks enabled firefighters to get water tankers much closer to the fires: "It's rough and steep country and carrying water to a fire is difficult."

Neighbouring landowner Peter Ebsary, who had about 250ha burnt out, said the all-weather new roads meant fire vehicles could now hurtle along the ranges at more than 60km/h, as well as providing a very effective firebreak: "Without those roads the fire would have burnt out much more property," he said.

While Pat Coffey is pleased that his crews have access to the new roads, he wishes they'd been extended another half kilometre further south to the communications tower, and a similar distance further north, which would have provided links with other existing roads. He lives in hope.

Snowtown 2 Wind Farm project manager, Jim Pearson, said he was delighted with the positive communication and working relationship that had been established between the landowners, CFS and site contractors as a result of the fires.

"CatCon and Consolidated Power Projects also supported the CFS with their firefighting utes and a diesel truck," he said. "We're pleased we were able to help in addressing the high fire risk situation this summer."

Meanwhile, the extended summer weather has been ideal for the 110 contractors working on site, who have construction of Stage 2 of the Snowtown Wind Farm running right on track.

Construction of the transmission line is ahead of schedule, the wind farm sub-station is being built with completion due at the end of October, while pouring of the wind turbine foundations is half completed. Shipments of major components such as blades and towers are expected to begin in mid-May, with turbine construction due to start in August

BURNT one side, saved on the other by turbine access road.– Picture supplied by TrustPower.

Appendix 6 – Outstanding BVA Questions to Neoen

Questions to Neoen (19 April 2017)

The Beetaloo Valley Association (BVA) would like to respond, and seek further clarification, on the Neoen Responses to questions and concerns posed at the meeting on 9 February 2017.

Section A – Response to Questions taken on notice

Question No. 1 – Why has Neoen included a 1.5 km setback from wind turbines to neighbouring residences?

BVA Comments

- All current wind turbine guidelines are out of date and do not reflect current industry standards or research results.
- Setbacks suggested in wind turbine guidelines were established for wind turbines that are significantly smaller than those proposed by Neoen and may need to be proportionately scaled to preserve the intent of the original guideline.

Further Questions

Q1.1. Has Neoen carried out any studies or made any enquiries to verify that the setbacks for its proposed wind turbines meet the original intent of out-dated wind turbine guidelines?

Question No. 2 – How does Neoen view health impacts from wind farms?

BVA Comments

- Neoen claims that the NHMRC concluded that *".....there is no published evidence to link wind turbines with adverse health effects."* The actual quote from the NHMRC Statement is that *".....there is currently no consistent evidence.....".* There is a significant difference in these two statements.
- Absence of evidence is not evidence of absence!
- In fact, the NHMRC Statement indicates that there is sufficient prima facie evidence to suggest a possible link between wind farms and human health.

  "Given these reported experiences and the limited reliable evidence, NHMRC considers that further, higher quality, research is warranted."

- *Limited Reliable Evidence* ***IS NOT*** *No Evidence*
- *The* UK Health Protection Agency report RCE-14 referenced by Neoen was published in 2010, is out of date and uses similar language to the NMHRC:

"There is no consistent evidence of any physiological or behavioural effect of acute exposure to infrasound in humans. There is, however, little good quality research and interpretation is complicated because low frequency noise often includes audible as well as infrasonic frequencies. At high levels of infrasound, aural pain and eardrum rupture can occur. There have been few studies on longer-term effects of infrasound in humans....."

- The WHO has recognised the growing body of research over the last few years and is currently updating its environmental noise guidelines. Indications are that the updated guideline will include infrasound, low frequency noise and vibration. An excerpt from the WHO media release follows:

  "The European office of the World Health Organisation (WHO) is in the process of developing Environmental Noise Guidelines for the European Region as a regional update to the WHO Community Noise Guidelines.

  The new Guidelines will be based upon a review of evidence of the health effects of environmental noise in the light of significant research carried out in the last few years.

  For the first time the panel is investigating adverse health issues in local residents following the construction of wind turbines, the health benefits of noise mitigation and possible government intervention to decrease noise levels.

  It will look at adverse affects such as: sleep disturbance, annoyance, cognitive impairment, mental health and wellbeing, cardiovascular diseases, hearing impairment and tinnitus and adverse birth outcomes."

- There are several thousand research papers on the human health effects of wind turbines, and to date the BVA has been unable to find even one paper that proves that there is no link.

- All the reports and statements from the NMHRC, UK Health Protection Agency and WHO reference a significant volume of research that has established a human health effect from wind turbines. The only piece missing from the puzzle is defining the mechanism of the cause.

Further Questions

Q2.1. Has Neoen received any reports of health effects from wind farm neighbours at any site it operates or has shareholdings?

Q2.2. What actions have been taken to investigate the cause of the reported effects?

Q2.3. Can BVA have a copy of those reports?

Q2.4. Will Neoen provide copies of published studies that *'prove the absence'* of a link between human health effects and wind turbines? (See BVA Comments above regarding evidence)

Q2.5. Will Neoen agree to incorporate recent wind turbine noise and vibration monitoring recommendations that have been published by recognised experts since the EPA noise guidelines were published in 2009?

Q2.6. Will Neoen provide the BVA a written guarantee that its wind turbines will not create any adverse human health effects?

Q2.7. Will Neoen provide the BVA a written guarantee that the following remedies will be fully funded if adverse impacts can be demonstrated beyond a reasonable doubt:

(a) Reimbursement of all medical expenses relating to health effects from the wind turbines?

(b) Reimbursement of all costs associated with residential noise and vibration reduction measures required to mitigate nuisance and adverse human health effects from the wind turbines?

Question No. 3 – Do wind turbines affect firefighting?

BVA Comments

- The link provided by Neoen to the CFS document on aerial firefighting limitations states the following:

  "Vertical obstructions such as power lines, weather masts, radio and television transmission towers, tall trees and wind turbines close to a fire area may limit aerial firefighting operations. Where obstructions do exist, a dynamic risk assessment is undertaken by the pilot in command prior to aircraft being committed. In some circumstances aircraft will not be utilised because risks caused by vertical obstructions exceed safe operating conditions."

- The aviation report generated by Hart Aviation for the Berrimal Wind Farm makes the following recommendations:

  "Helicopter or fixed wing aircraft operations within the confines of any wind farm and below the top of the wind turbines are potentially hazardous and not recommended."

- Aerial firefighters may treat wind turbines as they would any other tall structure; however the size and density of wind turbines will have a significant impact on aerial access in the proximity of wind turbines.

- The literature contains many examples of fires being initiated by turbine failures. Turbines contain significant volumes of highly flammable materials (Oils, GRP,etc.). As a result, turbines and the associated maintenance actions will introduce an additional fire risk to the Ranges and Protected Landscape Zones of the Flinders Ranges.

Further Questions

Q3.1. Will Neoen acknowledge that the presence of wind turbines and maintenance activities will increase the fire risk to the Ranges and Landscape Protected Zones of the Flinders Ranges?

Q3.2. Will Neoen acknowledge that the presence of wind turbines in the Ranges and Landscape Protected Zones of the Flinders Ranges will reduce aerial firefighting access compared to areas where there are no wind turbines?

Q3.3. Will Neoen acknowledge that this reduced aerial firefighting capability will increase the risk to the Ranges from bush fire?

Q3.4. Will Neoen acknowledge that increased bush fire risk will increase the risk to residents safety and property?

Q3.5. Has Neoen contacted CASA to advise of the intended construction of wind turbines within 30 Kms of the Port Pirie Airport?

Q3.6. Has CASA imposed any requirements on the wind turbine construction?

Q3.7. Has Neoen conducted an aerial firefighting impact assessment for the proposed development site?

Q3.8. Will Neoen provide the BVA with a copy of the impact assessment?

Q3.9. Will Neoen include an aerial firefighting impact assessment in its development application?

Q3.10. What is Neoens understanding of the typical risk mitigation action resulting from a pilot's 'dynamic risk assessment'?

Question No. 5 – Could the Beetaloo Valley Association select its own noise expert?

BVA Comments

- In the Neoen response to this question, Neoen has referenced the SA EPA's 'Wind farm environmental noise guidelines (2009).

  The 'Disclaimer' prefacing the guidelines reads:

  "This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice."

- The BVA assert that compliance with this guideline alone is not sufficient evidence to demonstrate discharge of the 'General Environmental Duty' required under Section 25 of the South Australia Environmental Protection Act 1993.

- The BVA rejects the nomination of Marshall Day to carry out an independent review of the report by Neoen's acoustic consultant. As reported by Senator John Madigan to the Federal Senate on 15 September 2015, Marshall Day have been implicated in ongoing falsification of compliance reports to the benefit of a wind turbine operator.

  In addition, Marshall Day have been engaged by wind farm operators for many years to represent them against individuals and organisations like the BVA.

The BVA has no confidence in the 'independence' of Marshall Day and would prefer to nominate its own independent acoustic expert.

Further Questions

Q5.1. Will Neoen answer the original question and agree to an independent acoustic expert selected by the BVA? (See BVA comments regarding Marshall Day)

Q5.2. Will Neoen supply the BVA with the proposed turbine supplier's full range of vibration and noise data prior to the development application?

Q5.3. Will Neoen acknowledge that the current SA EPA Wind farms environmental noise guidelines (2009) fail to address many of the low frequency noise findings from recent acoustic studies?

Q5.4. Will Neoen acknowledge that under the South Australia Environmental Protection Act 1993 it has a 'General Environmental Duty' (refer S25) to not cause 'Environmental Harm' (refer S5)?

Q5.5. Will Neoen authorise its acoustic consultant (Sonus) to share with the BVA the detail of its proposed methods for the following:

- Background noise study
- Regression analysis
- Noise propagation modelling
- Compliance monitoring

Q5.6. Will Neoen finalise its wind turbine selection and location prior to the Development Application?

Q5.7. Will Neoen agree to consult with the BVA prior to any equipment or location changes after submission of the development application?

Question No. 7 – What is Neoen's contingency plan for any loss of TV or mobile phone reception caused by the project?

BVA Comments

- BVA residents and the CFS rely on mobile and UHF communications during firefighting events and any loss of communication due to wind turbine interference will put lives and property at risk.

Further Questions

Q7.1. Will Neoen guarantee no loss in reception with TV, mobile phones and the emergency UHF communication channels used for coordination of firefighting?

Q7.2. Will Neoen provide a written guarantee that where TV, mobile phone or emergency UHF communications are affected, Neoen will fully fund remedial actions to return these services to current levels?

Question No. 8 – What is Neoen's contingency plan for fire management?

BVA Comments

- Unmanned facilities present an increased fire risk.
- Given the environmentally sensitivity and relative isolation of the proposed wind turbine sites, the BVA believes that fire monitoring, alarming and automated suppression systems are justified.

Further Questions

Q8.1. What fire detection and alarm equipment does Neoen propose to install at each asset site? (ie each turbine, workshop, substation, etc.)

Q8.2. How does Neoen propose to respond to a fire during construction?

Q8.3. How does Neoen propose to respond to a fire during operation?

Question No. 10 – Which access roads does Neoen intend to use?

BVA Comments

- The proposed wind turbine site is bounded by the Heysen Trail. The Heysen Trail is a world renowned SA icon and each year, hundreds of bushwalkers from all over the world traverse the trail.
- Placing people in close proximity with the construction machinery and heavy vehicles associated with construction and operation of a wind farm is inherently dangerous.

Further Questions

Q10.1. What traffic control procedures does Neoen plan to implement to ensure that users of the Heysen Trail and local roads are not subjected to risks from construction machinery and heavy vehicles during construction?

Q10.2. Will Neoen acknowledge that the wind farm development will increase the risks to users of the Heysen Trail?

Q10.3. When is the GHD Traffic and Transport Report due?

Q10.4. Will Neoen share the report with the BVA?

Q10.5. Will Neoen restore and maintain roads after construction?

Question No. 12 – Does Neoen commit to funding a study on the impact of the project on raptors?

BVA Comments

- The study on raptors should form part of a broader study on overall fauna and flora.

Further Questions

Q12.1. Who does Neoen plan to use to conduct the raptor study?

Q12.2. What will be the scope of the raptor study?

Q12.3. When does Neoen plan to conduct the raptor study?

Q12.4. Will Neoen commit to an ongoing monitoring program on raptors?

Q12.5. What actions will Neoen take where impacts on raptors are identified through the study or ongoing monitoring program?

Q12.6. Will Neoen include the results of this study and the proposed monitoring and action plan in its development application?

Q12.7. What other fauna and flora impact assessments does Neoen plan to carry out and when?

Section B – Response to Key Issues

Response No. 2 - Visual

BVA Comments

- In Neoen's response to the BVA it refers to the photo montages produced from the photos provided by the BVA as *".....four additional photo montages."*

Further Questions

Q1. Will Neoen share all photo montages with the BVA?

Q2. Who is the independent consultant engaged by Neoen to conduct the Landscape and Visual Assessment?

Q3. How does Neoen propose to "work with the community in determining important viewpoints" regarding the visual impact of the project?

Q4. Will Neoen provide the BVA with a copy of this report prior to submitting its development application?

Response No. 3 – Noise

BVA Comments

- Neoen acknowledges that the Crystal Brook Energy Park will have an impact on the project area.

- Recent acoustic studies have proven that the existing wind farm noise guidelines are incomplete and fail to address noise in the 0 to 500 Hz frequency range.
- Acoustic experts around the world acknowledge that dB(A) noise measurements are only valid for measuring the human perception of loudness within the human audible frequency range (20Hz to 20 KHz).
- The weightings applied to noise readings below 20 Hz effectively nullify any readings.
- Recent medical studies have confirmed the health effects of noise in the 0 to 500 Hz frequency range.
- The Queensland Governments draft wind farm state code recognises the presence of low frequency noise and requires noise measurement other that dB(A) to be utilised to measure low frequency noise.
- Due to the unique topography of Beetaloo Valley, the BVA believes that background noise studies should be conducted at the residences in Beetaloo Valley.
- In addition, the BVA believes that compliance monitoring for the first three years (minimum) should be performed at all residences in Beetaloo Valley to identify any unique noise propagation influences.

Further Questions

Q1. Will Neoen agree to conduct background noise studies at all Beetaloo Valley residences?

Q2. Will Neoen agree to conduct background noise studies that reflect the full seasonal wind spectrum and worst case wind direction for all BVA residences?

Q3. Will Neoen agree to a modified noise criteria that includes a method for measuring and predicting noise impacts in the 0 to 500 Hz frequency range?

Q4. Will Neoen acknowledge that the use of dB(A) noise measurements is not appropriate for noise measurement in the low frequency ranges?

Q5. Will Neoen agree to modified compliance conditions that would limit wind farm noise at all receivers to <5 dB (linear) above agreed background noise levels (also measured in dB linear) for all wind speeds and all noise frequencies - including indoor residential measurements; as assumed outdoor to indoor attenuation assumptions are invalid for low frequency noise?

Q6. How does Neoen propose to 'prove' that 'no harm' will result from the proposed wind farm development?

Q7. Will Neoen agree to measure noise compliance at all BVA residences using the proposed modified noise criteria during construction and during the first three years of operation?

Q8. Will Neoen include all the above details in its development application?

Response No. 4 – Property Values

BVA Comments

- Under the South Australia Environmental Protection Act 1993 (S5), any actual or potential financial loss of >$5,000 is deemed 'Material Environmental Harm' and any actual or potential loss of >$50,000 is deemed 'Serious Environmental Harm'.

- Global studies have shown that wind farms generally reduce property values by as much as 20%-80%. Even a 20% loss of property value would exceed the $50,000 trigger for 'Serious Environmental harm'.

Further Questions

Q1. Will Neoen provide the BVA a written guarantee that where loss of property value can be demonstrated, beyond a reasonable doubt, Neoen will compensate property owners for any realised loss should they choose to sell and move from the area?

Q2. What evidence of reduced property valuation will Neoen accept?

Section C – New issues the BVA wish to raise with Neoen

The Beetaloo Valley Association would like to raise a number of new issues with Neoen. These issues represent significant concerns to the BVA and a detailed written response on each issue would be appreciated. Where Neoen's response references specific studies or other documentation, the BVA would appreciate copies or a link to the documents.

Issue No. 10 – Vibration

BVA Comments

- Acoustic studies have confirmed that vibration from wind turbines is also transmitted seismically to residences at a power and frequency sufficient to cause nuisance and harm to people.

- This vibration is induced by wind impacts and vortex shedding on the turbine blades and mast.

- The vibration is transmitted through the turbine foundations to the surrounding rock and soil structures and has sufficient power to impact residences within several kilometres.

- Medical studies have confirmed that vibration has a significant impact on human health.

- In addition to the impact on residences, studies have shown that seismic vibrations have negative impacts on the following:

    a. Soil compaction leading to loss of crop yield
    b. Burrowing wildlife leading to loss of habitat
    c. Ground water quality
    d. Unexploded ordinance (present in the abandoned Army munitions dump)

Questions

Q1. Does Neoen acknowledge the likelihood of vibration being transmitted through the ground from its wind turbines?

Q2. Will Neoen share wind turbine manufacturer's vibration data for airborne and seismic transmission?

Q3. Does Neoen plan to conduct any geotechnical and seismic studies to ensure that vibration transmission does not create nuisance or adverse health effects in BVA residences?

Q4. Does Neoen plan to include seismic monitoring to ensure no 'Environmental Harm'?

Q5. Will Neoen agree to incorporate recent wind turbine design and vibration monitoring recommendations published since the EPA noise guidelines were published in 2009?

Q6. Will Neoen provide a written guarantee that vibration from its wind turbine operation will create no 'Environmental Harm'?

Q7. Where 'Environmental Harm' is proven beyond a reasonable doubt, will Neoen agree to fully fund all remedial actions required to mitigate the harm?

Q8. Will Neoen agree to compliance limits on vibration?

Issue No. 11 – Accuracy of information from Neoen

BVA Comments

- The following legal notice appears on the Neoen website:

    "The information provided on the www.neoen.fr or www.neoen.com websites are provided only for information purposes. **Neoen does not guarantee that the information provided on the website is accurate, complete or up-to-date.** The information may be updated, amended or deleted at any time. The information appearing on the website does not dispense the user from having to make any required complementary assessment."

- See BVA Q3. below - On the Crystal Brook Energy Park website, the following FAQ and response appears:

Question: Are there any health risks associated with wind farms?

Response: Some 17 reviews of research literature conducted by leading health and research organisations from all over the world, including the World Health Organisation, Australia's National Health and Medical Research Centre, the UK Health Protection Agency and the US National Research Council, have concluded that there is no published evidence to positively link wind turbines with adverse health effects.

- The BVA has concerns that the scaling of the wind turbines in the photo montages provided by Neoen may be inaccurate.

Questions

Q1. Why does Neoen not guarantee the information that it has put on its website?

Q2. Does this legal notice also apply to the Crystal Brook Energy Park website?

Q3. Will Neoen agree to correct the misleading statement in the FAQ section regarding the health risks associated with wind farms?

Q4. What information from Neoen can be trusted as accurate, complete or up-to-date?

Q5. Will Neoen guarantee the accuracy of the written responses to the BVA questions?

Q6. Will Neoen confirm the make and model of wind turbines depicted in the photo montages provided?

Q7. Will Neoen confirm that the turbines depicted in the photo montages are representative of the turbines proposed for the Crystal Brook Energy Park?

Q8. Will Neoen confirm that the scaling of the turbines in the photo montages is accurate?

Issue No. 11 – Impact on agriculture and natural resources

BVA Comments

- Members of the BVA rely on agriculture for income and personal consumption.
- Members of the BVA rely on natural resources such as ground water to support their agriculture and personal consumption.
- The location of wind turbines will significant reduce aerial agriculture activities and may force farmers to transition to less profitable crops and the use of more expensive spraying methods.

Questions

Q9. Has Neoen conducted a wind turbine impact assessment on agriculture and natural resources?

Q10. Will Neoen share this report with the BVA?

Q11. Will Neoen agree to compensate landowners for any loss of agriculture and natural resources as a result of the wind farm?

Section D – Additional general questions to Neoen

Q1. When does Neoen plan to submit its development application?

Q2. Does Neoen share its answers to the BVA questions with proposed Host land owners?

Q3. Does Neoen have a Corporate Social Responsibility (CSR) Policy?

Q4. Does the CSR Policy require Neoen to respect Local Communities and their Local Government Development Plan requirements?

Q5. Will Neoen provide the BVA with a copy of its CSR Policy?

Q6. Will Neoen provide the BVA with a copy of its complaints management procedure?

Q7. On the Crystal Brook Energy Park website, the following FAQ appears. What is Neoen's definition of "the average person"?

"Can wind turbines noise affect local residents?

Before it can operate, a wind farm has to demonstrate that noise levels at neighbouring residences will meet strict noise limits (35dB in rural areas, compared to background noises that generally range from 40 to 45dB).

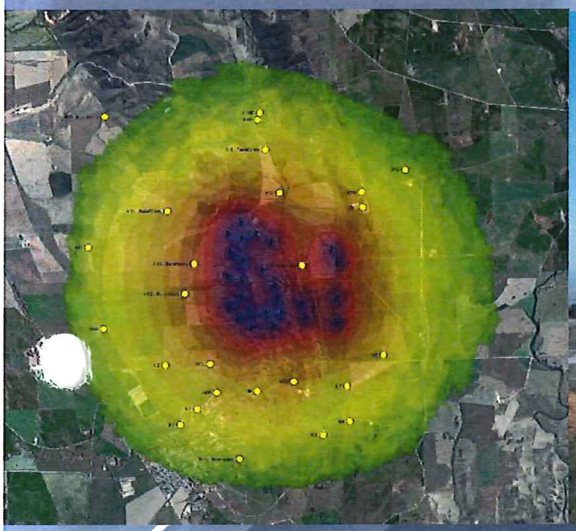
These limits are designed to ensure that the noise from a wind farm is not intrusive for the average person."

Q8. Is Neoen suggesting that we should not be concerned about people who don't meet the definition of the 'average' person?

NOISE MEASUREMENT SERVICES

NOISE IMPACT ASSESSMENT COMMENTARY
CRYSTAL BROOK WIND FARM
SOUTH AUSTRALIA

Report No 4154 20 June 2018



Noise Measurement Services Pty Ltd
18 Lade Street, Enoggera QLD 4051
PO Box 2127, Brookside Centre QLD 4053

Ph: (07) 3355 9707
Fax: (07) 3355 7210
Email: info@noisemeasurement.com.au

Document Control Page

NOISE MEASUREMENT SERVICES PTY LTD

18 Lade Street, Enoggera QLD 4051
PO Box 2127
Brookside Centre, QLD 4053

Telephone: (7) 3355 9707
Facsimile: (7) 3355 7210
E-mail: info@noisemeasurement.com.au

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Revision No	Issue Date	Revision Description	Author	Review
0	20/06/2018	Report	BT, MD	MT

Copy No(s)	Rev No	Destination
1 pdf	0	Ian Peterson
2	0	Noise Measurement Services

REPORT FOR **Ian Peterson**

CONTACT **Ian Peterson**

Signed

Dr Bob Thorne PhD, FRSPH, MIOA
(Principal)

Contents

Executive Summary

This Report is in response to a request from Mr Ian Peterson for a noise impact assessment commentary with respect to the proposed Crystal Brook Energy Park (CBEP). The commentary presents a set of noise impact assessments based on turbine data provided in Sonus CBEP documentation. The provenance and application of the South Australian wind farm noise guidelines are discussed. The potential for noise impacts is identified.

Introduction

The proposed Crystal Brook Energy Park will have up to 125MW of wind generation comprising 26 turbines (up to 240m in height). Documentation for this project is sourced from:

https://www.saplanningcommission.sa.gov.au/__data/assets/pdf_file/0005/462857/354_V003_18_Application_docs_Part_1.pdf

and

https://www.saplanningcommission.sa.gov.au/__data/assets/pdf_file/0006/462858/354_V003_18_Application_docs_Part_2.pdf

Neoen documentation states that:

The wind turbines and their sites have been selected and sited to meet key impact management criteria including:

- *The EPA's noise criteria*
- *A minimum distance of 1km from un-involved residences and 2km from the closest zoned living area (the Rural Living Zone)*

However, Neoen also states, in relation to concern about noise and potential health effects:

Concern raised in relation to noise and infrasound and potential health impacts on the local community	The development must comply with the SA Environment Protection Authority (EPA) Wind Farm Guidelines. Expert acoustic engineering advice has been integral to the siting of the proposed wind turbines to ensure the SA Environment Protection Authority (EPA) Wind Farm Guideline is met. Regarding infrasound, there is no scientific data to suggest that the levels of low frequency noise emitted by wind turbines make humans sick. Research to date has not shown any negative health effects at the noise levels produced by operational wind turbines. The project team has also taken a conservative approach, and no wind turbines will be located within 1.3km of a non-involved landholder (the Guidelines specify 1km).

DISCUSSION

1. Ambient Sound Levels

Appendix A refers to the ambient noise level and weather surveys being undertaken by residents.

2. Wind Farm Noise Calculations

Wind farm noise calculations, tabulated sound levels at residences, and graphical noise exposure contours are presented in Appendix B. A standard (ISO 9613-2) noise prediction model is applied. Two wind turbine sound power levels are applied; 105 dB(A) and 110 dB(A), as there is no certainty that the *indicative* 105 dB(A) SWL noise turbine nominated in the Sonus report 'Crystal Brook Energy Park Environmental Noise Assessment March 2018' will be the turbine installed.

- The 110 SWL contour provides a practical and reasonable approach to assessing the '105 dB SWL turbine plus 5 dB penalty for amplitude modulation' zone of influence.
- As an absolute the minimum the applicant must provide the true certified sound power levels, operational conditions (e.g. is there a 'low-noise' mode) and wind speed data for each turbine type to be installed.

3. Potential for Adverse Health Effects

An Administrative Appeals Tribunal Decision that specifically addresses the potential for adverse health effects due to wind farm noise is presented in Appendix C.

4. South Australia Noise Legislation and Wind Farm Guidelines

Relevant sections of the South Australian noise policy, noise characteristics and wind farm guidelines are presented and discussed in Appendix D.

5. Amplitude Modulation and Other Characteristics

Relevant sections from a Sonus paper addressing wind farm noise, amplitude modulation and other characteristics are presented in Appendix E. This material and a potential 5 dB penalty is not addressed in the Sonus report 'Crystal Brook Energy Park Environmental Noise Assessment March 2018'.

6. Glossary

A Glossary of terms is provided in Appendix F.

Appendix A: Ambient Sound Levels

Ambient sound level monitoring commenced at three residential locations in October 2017. Sound levels are collected at 10-minute intervals with Class 1 BSWA Model 308 sound level meters. Depending on the location, each meter collects time-average (LAeq) and statistical (e.g. LA90) sound levels or time-average and one-third octave band sound levels.

Each meter is connected to a soundcard to record audible, low frequency and infrasound. A second microphone provides recording for infrasound and low frequency sound.

A Davis weather station collects weather data as wind speed and direction, temperature, humidity, barometric pressure and rainfall, also at 10-minute intervals.

Appendix B: Wind Farm Noise Calculations

The ISO 9613 standard from 1996 is the most used noise prediction method worldwide. Many countries refer to ISO 9613 in their noise legislation. However, the ISO 9613 standard does not contain guidelines for quality assured software implementation, which leads to differences between applications in calculated results. In 2015 this changed with the release of ISO/TR 17534-3. This quality standard gives clear recommendations for interpreting the ISO 9613 method. The calculations in this Commentary are implemented with SoundPLAN 8. SoundPLAN supports and complies with changes that have been proposed to ISO/TR 17534-3:2015, relating to acoustics software for the implementation of standards associated with the calculation of sound outdoors.

The recommended changes outlined to ISO 9613-2 will help improve the accuracy of calculated sound levels, which can currently differ significantly.

Noise modelling presents 'single-figure dB(A)' values to provide a ***simplified overview of potential noise exposure.*** The effects of low frequency sound and amplitude modulated sound are not considered. ***As such, the levels must be adjusted in terms of real-life '24/7/365' application.***

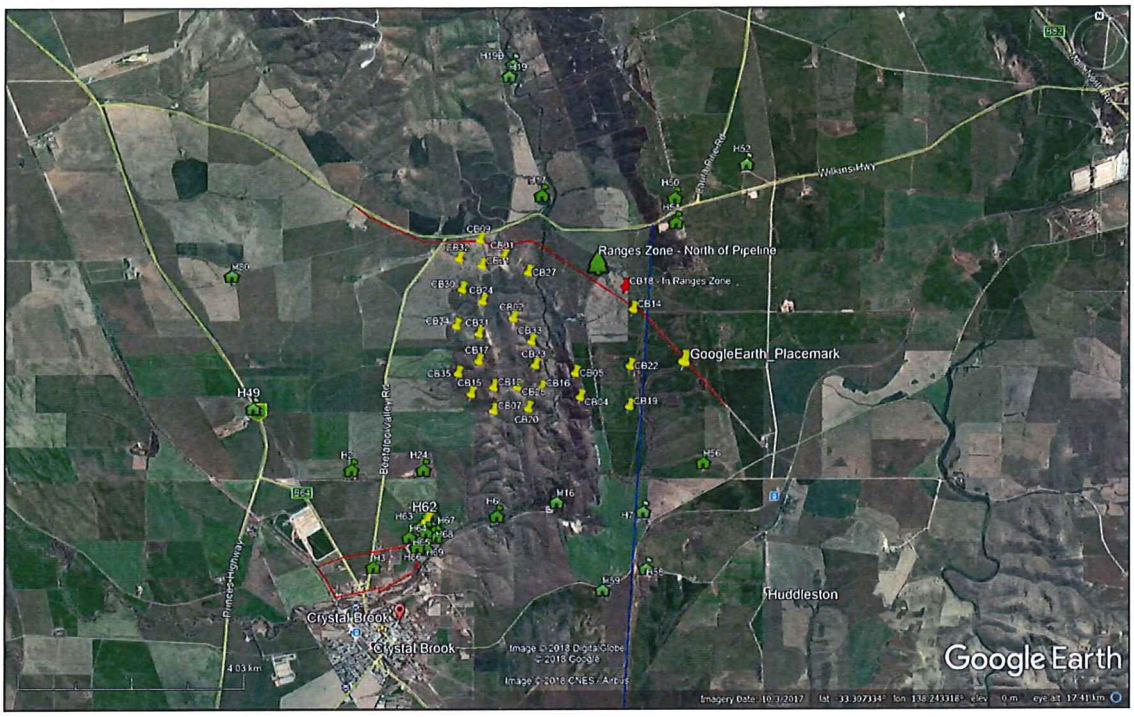
The calculations and modelling in this Commentary are under Default conditions as these present the readily assessable conditions for a slight downwind breeze for comparison purposes. ***In practice, under field observations, real conditions can vary significantly due to temperature changes, changes in wind speed and direction, and changing operational conditions applied to the wind farm turbines.*** These variations can happen quickly, in minutes, and noise modelling does not normally present these important variations.

Model Variables	
Noise Model Standard	ISO 9613-2: 1996
Air absorption Standard	ISO 9613-1
Ground Absorption Factor	0.5
Air Pressure	1013.3 mbar
Relative Humidity	70.00%
Temperature	10.0 °C
Receptor Height (m)	1.5

Noise Source											
Model	GE 4.8-158 Wind Turbine Generator										
Hub Height (m)	160										
Rotor Diameter (m)	158										
Sound Power Level	Sum	16Hz	31Hz	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
dB(Z)	125	124	117	113	109	105	101	101	96	85	71
dB(A)	105	67	78	87	93	96	98	101	97	86	70

The noise prediction locations and turbine sound power data have been recorded from information provided by Mr Peterson.

Residences and Turbines



Results for the ISO Default condition, Port Pirie wind rose, and 100% southerly wind at 6m/s are presented in Table 1 and graphically in Plates 1 to 6.

Table 1: Summary forecast noise levels (LAeq) for different operational scenarios

Receiver	Forecast Noise Level (dB(A))					
	Turbine SWL 105dB(A)			Turbine SWL 110dB(A)		
	ISO Default Met	Port Pirie Met	100% Southerly Wind	ISO Default Met	Port Pirie Met	100% Southerly Wind
H2	29.0	27.6	26.5	34.1	32.7	31.6
H3	24.3	22.4	19.7	29.4	27.5	24.8
H4	27.3	25.6	23.1	32.4	30.7	28.2
H6	28.1	27.1	25.2	33.2	32.2	30.3
H7	30.0	29.1	27.4	35.1	34.2	32.5
H12 - Beneficiary	35.9	35.6	35.5	41.0	40.7	40.6
H13 - Beneficiary	37.9	37.7	37.8	43.0	42.8	42.9
H14 - Beneficiary	31.2	30.5	31.0	36.3	35.6	36.1
H15 - Beneficiary	40.5	40.5	40.5	45.7	45.6	45.6
H16	32.8	32.0	30.6	37.9	37.1	35.7
H17	35.1	34.9	35.1	40.2	40.0	40.2
H18 - Beneficiary	27.5	26.9	27.5	32.6	32.0	32.6
H19	24.6	23.7	24.6	29.7	28.8	29.7
H19B	23.9	23.0	23.9	29.1	28.1	29.0
H22 - Beneficiary	9.9	8.5	9.6	15.0	13.6	14.7
H24	33.0	32.4	31.8	38.1	37.5	37.0
H33 - Beneficiary						
H49	24.0	22.4	22.3	29.1	27.5	27.4
H50	29.4	28.8	29.3	34.5	33.9	34.4
H51	31.0	30.7	30.9	36.1	35.8	36.0
H52	22.0	21.2	21.9	27.1	26.3	27.0
H56	30.0	29.4	28.6	35.1	34.5	33.7
H58	23.9	22.5	19.5	29.0	27.6	24.6
H59	25.3	23.6	20.3	30.4	28.8	25.4
H60	30.2	29.0	26.9	35.3	34.1	32.0
H75 - Beneficiary	19.5	17.6	13.7	24.6	22.7	18.8
H80	22.5	21.1	21.8	27.6	26.2	26.9

Plate 1: Calculations under ISO 9613-2 default settings, turbines at 105 dB(A) sound power level

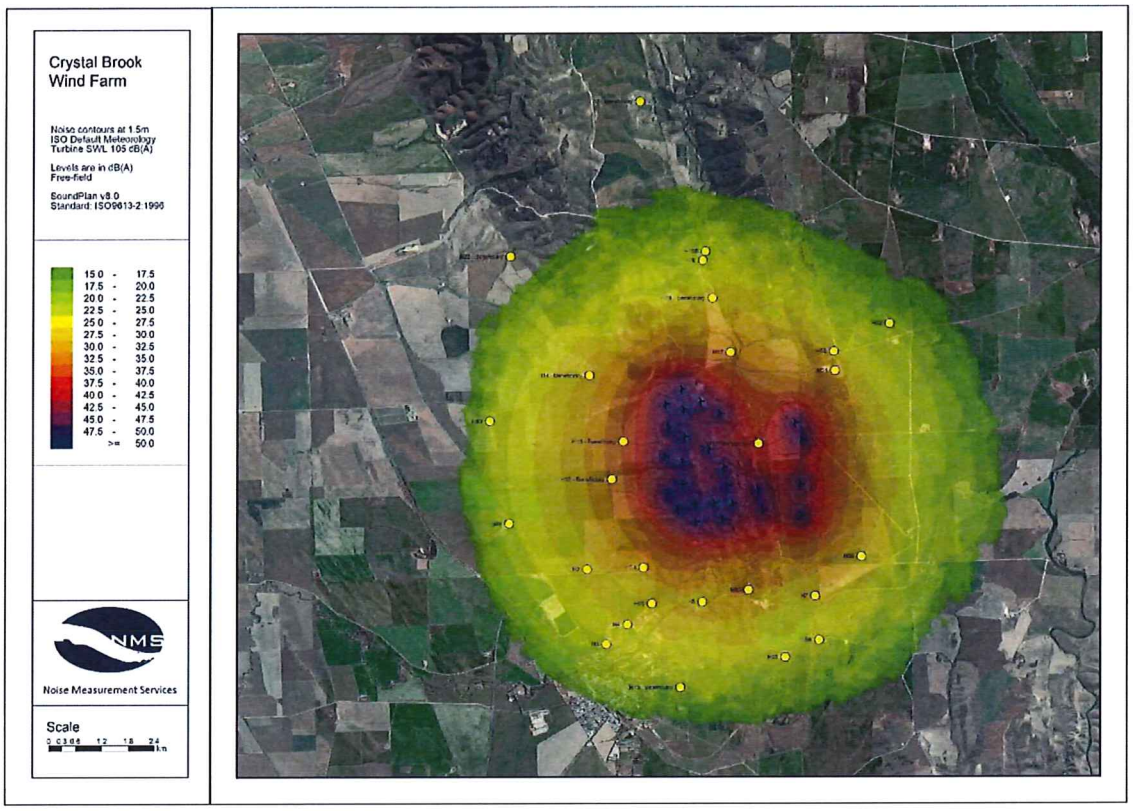


Plate 2: Calculations with Port Pirie wind rose data, turbines at 105 dB(A) sound power level

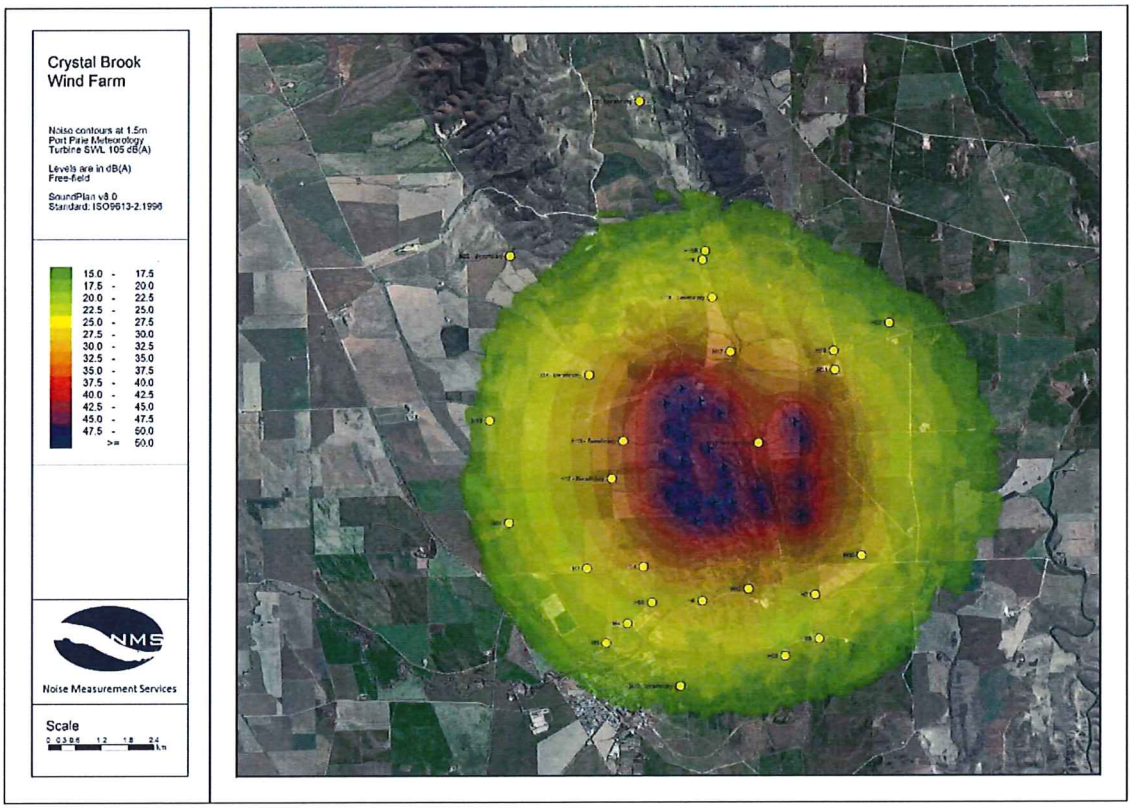


Plate 3: Calculations with 6m/s wind from the south, turbines at 105 dB(A) sound power level

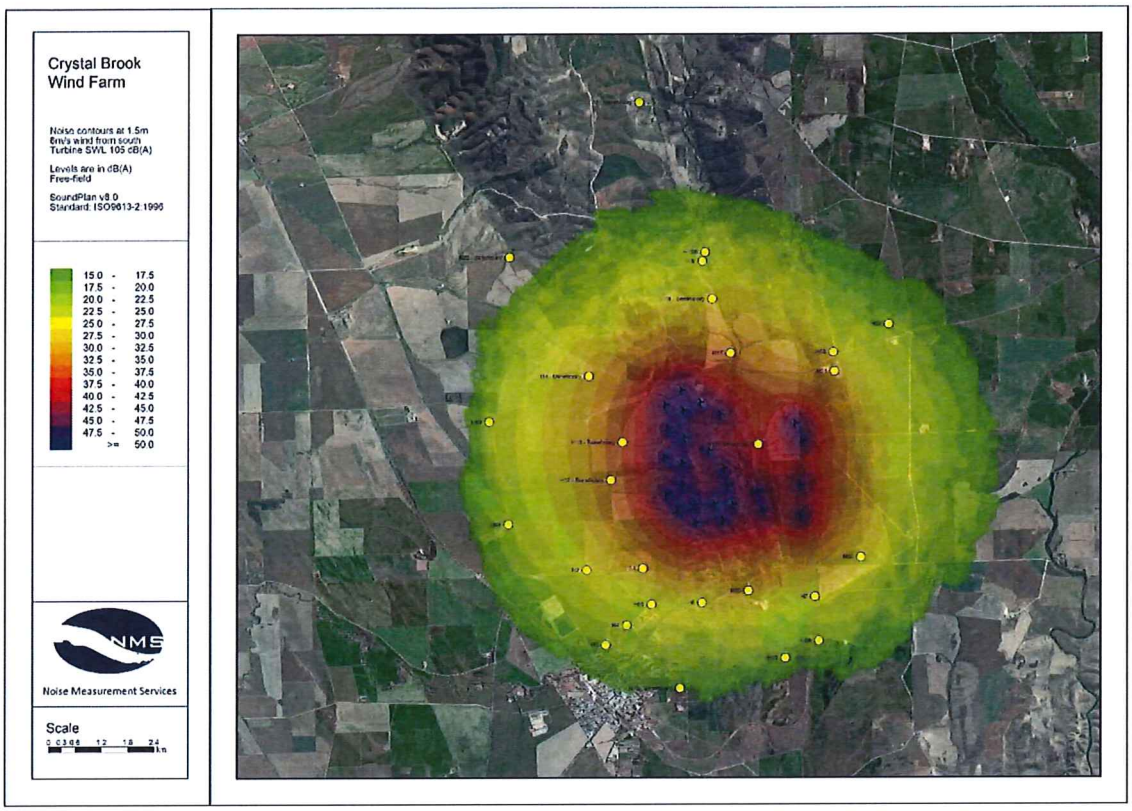


Plate 4: Calculations under ISO 9613-2 default settings, turbines at 110 dB(A) sound power level

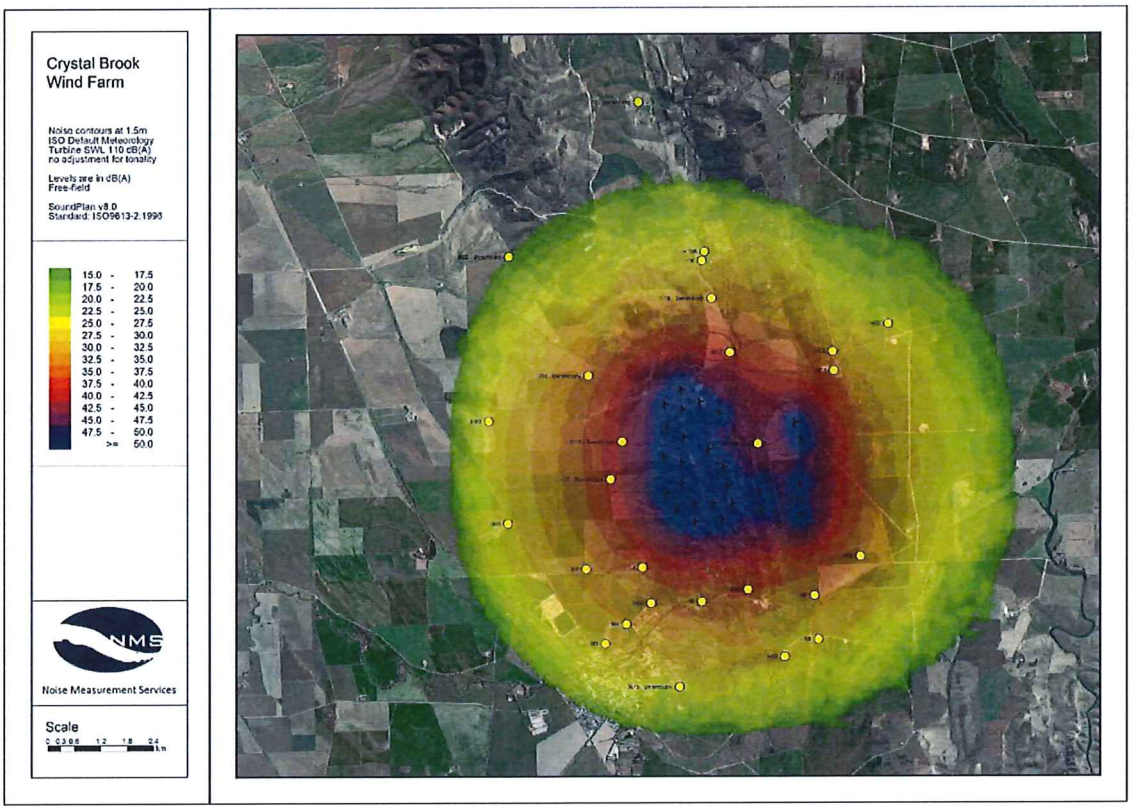


Plate 5: Calculations with Port Pirie wind rose data, turbines at 110 dB(A) sound power level

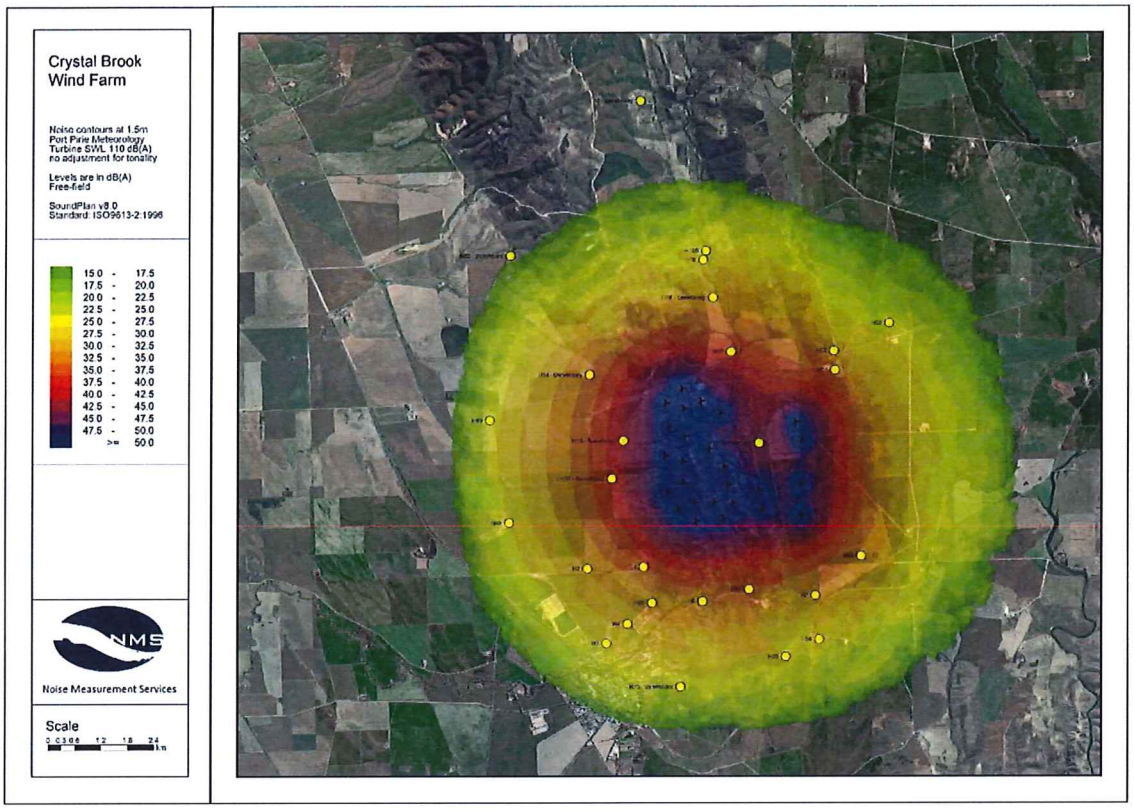
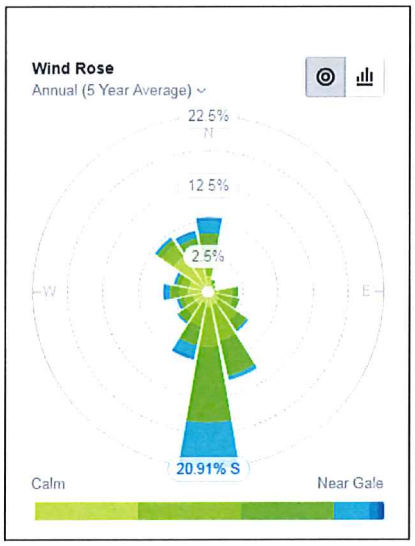


Plate 6: Calculations with 6m/s from the south, turbines at 110 dB(A) sound power level

Summary calculations

Receiver	Forecast Noise Level (dB(A))					
	Turbine SWL 105dB(A)			Turbine SWL 110dB(A)		
	ISO Default Met	Port Pirie Met	100% Southerly Wind	ISO Default Met	Port Pirie Met	100% Southerly Wind
H2	29.0	27.6	26.5	34.1	32.7	31.6
H3	24.3	22.4	19.7	29.4	27.5	24.8
H4	27.3	25.6	23.1	32.4	30.7	28.2
H6	28.1	27.1	25.2	33.2	32.2	30.3
H7	30.0	29.1	27.4	35.1	34.2	32.5
H12 - Beneficiary	35.9	35.6	35.5	41.0	40.7	40.6
H13 - Beneficiary	37.9	37.7	37.8	43.0	42.8	42.9
H14 - Beneficiary	31.2	30.5	31.0	36.3	35.6	36.1
H15 - Beneficiary	40.5	40.5	40.5	45.7	45.6	45.6
H16	32.8	32.0	30.6	37.9	37.1	35.7
H17	35.1	34.9	35.1	40.2	40.0	40.2
H18 - Beneficiary	27.5	26.9	27.5	32.6	32.0	32.6
H19	24.6	23.7	24.6	29.7	28.8	29.7
H19B	23.9	23.0	23.9	29.1	28.1	29.0
H22 - Beneficiary	9.9	8.5	9.6	15.0	13.6	14.7
H24	33.0	32.4	31.8	38.1	37.5	37.0
H33 - Beneficiary						
H49	24.0	22.4	22.3	29.1	27.5	27.4
H50	29.4	28.8	29.3	34.5	33.9	34.4
H51	31.0	30.7	30.9	36.1	35.8	36.0
H52	22.0	21.2	21.9	27.1	26.3	27.0
H56	30.0	29.4	28.6	35.1	34.5	33.7
H58	23.9	22.5	19.5	29.0	27.6	24.6
H59	25.3	23.6	20.3	30.4	28.8	25.4
H60	30.2	29.0	26.9	35.3	34.1	32.0
H75 - Beneficiary	19.5	17.6	13.7	24.6	22.7	18.8
H80	22.5	21.1	21.8	27.6	26.2	26.9

Plate 7: Port Pirie wind rose



Port Pirie is the closest BOM station at 23 km distant
Wind rose recorded from:
https://wind.willyweather.com.au/sa/flinders-ranges-and-outback/port-pirie.html

Additional weather data for Crystal Brook is available in pictorial form from Meteoblue:

https://www.meteoblue.com/en/weather/archive/windrose/crystal-brook_australia_2073422

Appendix C: Potential for Adverse Health Effects

Whether there is evidence that wind farm emissions cause or are associated with diseases, and, whether there is a plausible basis for thinking that wind farm emissions could lead to disease has been considered in the case: Waubra Foundation and Commissioner of Australian Charities and Not-for-profits Commission [2017] AATA 2424 (4 December 2017). The Tribunal consisted of the **Honourable Justice White, Deputy President and Deputy President K Bean.**

The official link to the AAT decision on the Austlii website is here: http://www.austlii.edu.au/cgi-bin/viewdoc/au/cases/cth/AATA/2017/2424.html

The section of the judgment dealing with wind turbine noise being a pathway to disease is summarised here:

Excerpts from Pages 141 to 148 of the Decision

468. The propositions which we understand have unanimous support from the relevant experts or are not contested include the following:

- *Wind turbines emit sound, some of which is audible, and some of which is inaudible (infrasound);*
- *There are numerous recorded instances of WTN exceeding 40 dB(A) (which is a recognised threshold for annoyance/sleep disturbance);*
- *There are also recorded instances of substantial increases in sound at particular frequencies when particular wind farms are operating compared with those at times when they are shut down;*
- *If it is present at high enough levels, low frequency sound and even infrasound may be audible;*
- *WTN is complex, highly variable and has unique characteristics;*
- *The amount and type of sound emitted by a wind farm at a given time and in a given location is influenced by many variables including topography, temperature, wind speed, the type of wind turbines, the extent to which they are maintained, the number of turbines, and their mode of operation;*
- *Wind farms potentially operate 24 hours a day, seven days a week;*
- *There are numerous examples of WTN giving rise to complaints of annoyance from nearby residents, both in Australia and overseas.*

469. The propositions which are supported by the preponderance of relevant expert opinion, and which we accept on that basis, include the following:

- *A significant proportion of the sound emitted by wind turbines is in the lower frequency range, i.e. below 20 Hz;*
- *The dB(A) weighting system is not designed to measure that sound, and is not an appropriate way of measuring it;*

- *The most accurate way of determining the level and type of sound present at a particular location is to measure the sound at that location;*
- *The best way of accurately measuring WTN at a particular location is through 'raw' unweighted measurements which are not averaged across time and are then subjected to detailed "narrow-band" analysis;*
- *When it is present, due to its particular characteristics, low frequency noise and infrasound can be greater indoors than outdoors at the same location, and can cause a building to vibrate, resulting in resonance;*
- *Humans are more sensitive to low frequency sound, and it can therefore cause greater annoyance than higher frequency sound;*
- *Even if it is not audible, low frequency noise and infrasound may have other effects on the human body, which are not mediated by hearing but also not fully understood. Those effects may include motion-sickness-like symptoms, vertigo, and tinnitus-like symptoms. However, the material before us does not include any study which has explored a possible connection between such symptoms and wind turbine emissions in a particular population.*

470. We consider that the evidence justifies the following conclusions:

- *The proposition that sound emissions from wind farms directly cause any adverse health effects which could be regarded as a "disease" for the purposes of the ACNC Act is not established;*
- *Nor, on the current evidence, is there any plausible basis for concluding that wind farm emissions may directly cause any disease;*
- *However, noise annoyance is a plausible pathway to disease;*
- *There is an established association between WTN annoyance and adverse health effects (eg. this was established by the Health Canada study);*
- *There is an established association between noise annoyance and some diseases, including hypertension and cardiovascular disease, possibly mediated in part by disturbed sleep and/or psychological stress/distress;*
- *There are as yet no comprehensive studies which have combined objective health measurements with actual sound measurements in order to determine for a given population the relationships between the sound emissions of wind turbines, annoyance, and adverse health outcomes. Indeed there is as yet no study which has given rise to a soundly based understanding of the degree to which particular types or levels of wind turbine emissions give rise to annoyance, or what levels or types of emissions are associated with what level of annoyance in the population. Because it relied on calculated rather than actual sound measurements, and was limited to the A and C-weighted systems, the Health Canada study did not do this.*

473. The applicant submitted that the evidence in the hearing provided plausible and credible evidence of the kind required. Counsel referred in particular to the effect of noise on sleep and, in particular, in disturbing sleep. It was not contentious that impaired sleep, if sufficiently serious, may result in a number of

ailments and diseases. Professor Wittert said that "depression and sleep disturbance are, respectively, the first and third most common psychological reasons for patient encounters in general practice". The professor went on to say that insomnia doubles the risk of future development of depression and that insomnia symptoms together with shortened sleep are associated with hypertension. Professor Wittert also said that a person suffering from restricted sleep is exposed to an increased risk of elevated blood sugar levels and endocrine disorders such as diabetes, symptomatic ischaemic heart disease, hypertension, obesity, insomnia and anxiety related illnesses.

476. As our earlier findings have indicated, some wind farms generate sound which is capable of causing, and does cause, annoyance. We are further satisfied that annoyance of the kind which is generated (often associated with psychological distress and sleep disturbance), is a recognised pathway to a range of adverse health outcomes, including hypertension and cardiovascular disease.

481. It follows in our view that the applicant has established that there is a plausible basis for thinking that wind turbine sound (mediated by annoyance) may lead to adverse health outcomes, such as to warrant further investigation. It is unnecessary for us to draw conclusions as to the precise nature of the annoyance which is caused, and whether annoyance may be caused by sound which is not audible (infrasound). That is something which we expect will be the subject of further study and investigation. For our purposes, it is sufficient that annoyance is produced, and it appears that it may be associated with adverse health outcomes. An identification of the causes of that annoyance may allow it to be reduced or mitigated and adverse health outcomes to be reduced or avoided.

482. We regard it as particularly significant that the NHMRC has considered that, despite the absence of direct evidence that exposure to wind farm noise affects physical or mental health, and the poor quality direct evidence that wind farm noise is associated with annoyance or sleep disturbance, it is appropriate to provide funding to the extent of $3.3 million for an evaluation of the "sleep and physiological disturbance characteristics of wind farm noise compared to traffic noise" and for an investigation of whether "exposure to infrasound causes health problems". Given this degree of recognition by the NHMRC, we do not consider that it should be held that the associations which are the subject of the applicant's activities do not have plausibility or credibility, although not as yet positively established.

485. Given our finding that there is a plausible basis for considering that wind farm sound emissions may have an adverse effect on human health, we accept that conducting, supporting and advocating for further research or engaging in awareness raising activities could be properly characterised as activities promoting the prevention or control of diseases (in the sense of that term explained earlier).

Appendix D: South Australia Noise Legislation and Wind Farm Guidelines

The South Australia *Environment Protection (Noise) Policy 2007* under the *Environment Protection Act 1993* sets out the requirements for measuring and assessing noise. One of the critical terms is 'characteristic'.

The Noise Policy states that a ***characteristic***, in relation to noise from a noise source, means a tonal, impulsive, low frequency or modulating characteristic of the noise that is determined by the Authority or another administering agency, in accordance with the *Guidelines for the use of the Environment Protection (Noise) Policy 2007* published by the Authority as in force from time to time, to be fundamental to the nature and impact of the noise;

- ***low frequency characteristic***—a noise has a low frequency characteristic if it has a characteristic that dominates the overall noise with content between 20 hertz and 250 hertz;
- ***modulating characteristic***—a noise has a modulating characteristic if it varies significantly in frequency character or amplitude;

With respect to wind farms, the Policy states:

34—Wind farms
(1) If a person operates a wind farm, the Wind Farms Environmental Noise Guidelines 2003 prepared by the Authority apply.
(2) In this clause—wind farm means a group of wind turbine generators.

35—Issue of environment protection orders to give effect to guidelines
The Authority or another administering agency may issue an environment protection order to a person who undertakes an activity referred to in this Part to give effect to the guidelines that apply to the activity under this Part.

Comments:

1. It is understood that later Guidelines issued in 2009 are applied by the SAEPA although the Policy does not specifically allow for this later document. The disclaimer to the 2009 Guidelines state:

This publication is a guide only and does not necessarily provide adequate information in relation to every situation. This publication seeks to explain your possible obligations in a helpful and accessible way. In doing so, however, some detail may not be captured. It is important, therefore, that you seek information from the EPA itself regarding your possible obligations and, where appropriate, that you seek your own legal advice.

2. From a technical point-of-view, therefore, as sound/noise monitoring and evaluation professionals we would apply the provisions of the Policy relating to 'characteristics'. This position, we believe, is supported by the information recorded in Appendix E.

3. It would appear that the guidelines do not apply to a specific windfarm, e.g. Crystal Brook, unless and until an environment protection order has been issued to a person who undertakes the wind farm activity.

Appendix E: Amplitude Modulation and Other Characteristics

Sonus, in the document titled '*Wind Farms Technical Paper – Environmental Noise*' dated November 2010 to the Clean Energy Council, state:

Amplitude Modulation

Amplitude modulation is an inherent noise character associated with wind farms. It should be noted that the ambient environment modulates in noise level by a significantly greater margin and over a significantly greater time period than that which would be audible from a wind farm at a typical separation distance. Notwithstanding, the South Australian Guidelines (2003 & 2009) note that the objective standards include a 5 dB(A) penalty for this fundamental and inherent character of amplitude modulation.

A 5 dB(A) penalty is a significant acoustic impost. To reduce a noise source by 5 dB(A) requires either the distance between the source and the receiver to be approximately doubled, or the noise source to reduce its output by two thirds. In wind farm terms, this means the distance between the farm and the nearest dwellings might need to be doubled, or up to two thirds of the total turbine numbers would need to be removed, compared to a wind farm not subject to such a penalty.

The ability to hear the "swish" (amplitude modulation) depends on a range of factors. It will be most prevalent when there is a stable environment (temperature inversion) at the wind farm and the background noise level at the listening location is low. In addition, amplitude modulation is greater when located cross wind from a wind turbine (Olermans and Schepers, 2009). It is noted that whilst the amplitude modulation is greater at a cross wind location, the actual noise level from the wind farm will be lower than at a corresponding downwind location. These conditions are most likely to occur when wind speeds at the wind farm are low under a clear night sky.

The swish is at its greatest under the above conditions as the change in wind speed at increased heights above the ground is also at its greatest, and this results in an increased difference in wind speed as the blades move through the top of their arc and down past the tower. In addition, if there are several turbines subject to similar conditions, then it is possible this can have an amplifying effect on the modulation. The increase in swish under these specific conditions is termed the Van Den Berg Effect, and it is suggested higher levels of swish might result in higher levels of annoyance and potentially sleep disturbance.

The Van Den Berg effect was observed on a flat site in Europe under specific conditions and in the two matters before the NSW Land and Environment Court (Gullen Range wind farm NSW LEC 41288 of 2008 and Taralga wind farm NSW LEC 11216 of 2007), it has been determined by the relevant experts that the required meteorological conditions to trigger the effect were not a feature of the environment. In Gullen Range (NSW LEC 41288 of 2008), the meteorological analysis prepared by Dr Chris Purton concluded that

suitable conditions for this effect are not a feature of the area because of the elevated ridgeline location of the wind farm (Purton, evidence NSW LEC 41288 of 2008).

If suitable conditions did exist to regularly generate high levels of swish, then there is no scientific research to indicate that the existing Standards and Guidelines do not adequately account for it. Indeed, given the conditions are more likely to occur at night, then sleep disturbance would be the main issue to address, and the noise standards applied to wind farms are significantly more stringent than limits established for the potential onset of sleep disturbance. This is discussed in further detail in the following section.

In the first draft of the National Wind Farm Development Guidelines (EPHC, 2009), excessive swish is referred to as one of the potential Special Audible Characteristics (or SACs) along with low frequency, infrasound and tonality. It recommends that:

> *With the exception of tonality, the assessment of SACs will not be carried out during the noise impact assessment phase, that is, pre-construction. This arrangement reflects two key issues:*
>
> *i. There are, at present, very few published and scientifically-validated cases of any SACs of wind farm noise emission being problematic at receivers. The extent of reliable published material does not, at this stage, warrant inclusion of SACs other than tonality into the noise impact assessment planning stage.*
>
> *ii. In the case that reliable evidence did demonstrate merit in assessing such factors during the pre-construction phase, there is a gap in currently available techniques for assessing SACs as part of the noise impact assessment. In part this is due to the causes of most SACs in wind turbine noise emission not yet being clearly understood.*

In summary:

- Swish is an inherent noise characteristic of a wind farm;
- Modulation in noise level is a feature of the ambient noise environment surrounding a wind farm;
- The level and depth of swish can vary with meteorological conditions, and under certain conditions, will be more prevalent;
- The conditions to consistently generate high levels of audible swish have not been established to be a typical feature of Australian wind farms;
- The level, depth, time and testing regime for excessive swish that would justify introducing a more stringent standard have not been established;
- Sleep disturbance is the key issue associated with excessive swish, if it is to occur.

Appendix F: Glossary

Background sound pressure level (LA90,T), LA90

Commonly called the "L90" or "background" level and is an indicator of the quietest times of day, evening or night. The LA90 level is calculated as the noise level equalled and exceeded for 90% the measurement time. The measured LA90 time-intervals are arithmetically averaged to present the "average background" levels of the environment for day/evening/night. The level is recorded in the absence of any noise under investigation. The level is not adjusted for tonality or impulsiveness.

Equivalent Continuous or time average sound pressure level (LAeq,T), Leq

Commonly called the "Leq" level it is the logarithmic average sound/noise level from all sources far and near. The level can be adjusted for tonality.

CAUTION: this is NOT the same measure as described in the Noise Policy definition of ***ambient noise level (continuous)*** as the Policy definition applies the exponential Fast response.

Façade-adjusted level

A sound level that is measured at a distance of 1.0 metre from a wall or facade. The level is nominally 2.5 dB higher than the free-field level.

Free-field level

A sound level that is measured at a distance of more than 3.5 metres from a wall or facade.

Beneficial

- A term applied to a person or landowner who directly benefits from a project or activity.
- Landowner with a commercial agreement with the wind farm developer.

Sonus Pty Ltd
17 Ruthven Avenue
ADELAIDE SA 5000
Phone: (08) 8231 2100
Facsimile: (08) 8231 2122
www.sonus.com.au
ABN: 67 882 843 130

WIND FARMS TECHNICAL PAPER

Environmental Noise

Prepared for

CLEAN ENERGY COUNCIL
Suite 201, 18 Kavanagh Street
SOUTHBANK 3006

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S3387C6

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INTRODUCTION

Australian wind farms currently provide 1841MW of power or enough energy to power 772,286 homes (Clean Energy Council Renewable Energy Database, April 2010). With this level of generation comes a need to ensure their advantages are balanced against the amenity of the communities that live in their vicinity.

This Technical Paper has been prepared to provide the latest information to communities, developers, planning and enforcement authorities and other stakeholders on environmental noise from wind farms and includes:

- An explanation of the sources of noise from a wind farm and its characteristics;
- A summary of the various Australian wind farm noise standards and guidelines and a comparison of the local and International approaches;
- A description of the methodology associated with a detailed environmental noise assessment prepared for a wind farm in accordance with the relevant standards and guidelines;
- A description of the various terms used in those assessments including the ambient noise environment, background noise levels and characteristics such as modulation, tonality, infrasound and low frequency;
- A summary of the research conducted into a range of issues including:
    - Health impacts and annoyance;
    - Infrasound and low frequency;
    - Amplitude modulation; and
    - Sleep disturbance

EXECUTIVE SUMMARY

Virtually all processes generate noise, including wind farms. The response to noise by individuals can be wide and varied. Noise is often the most important factor in determining the separation distance between wind turbines and sensitive receivers. The assessment of noise therefore plays a significant role in determining the viability of and the size of wind farms.

Australian jurisdictions presently assess the noise from wind farms under a range of Standards and Guidelines applicable to each individual State or Territory.

The Standards and Guidelines used in Australia and New Zealand are stringent in comparison to other International approaches. They are also the most contemporary in the World, with recent updates and releases of the main assessment approaches occurring in both late 2009 and early 2010.

Notwithstanding the above, there are community concerns relating to both annoyance and health impacts associated with environmental noise from both planned and operating wind farms. As such, the Clean Energy Council has engaged Sonus to make an independent review of the available information relating to noise from wind farms.

The information in this Technical Paper results in the following key conclusions:

- The standards and guidelines used for the assessment of environmental noise from wind farms in Australia and New Zealand are amongst the most stringent and contemporary in the World;

- There are inherent discrepancies associated with a number of different approaches from jurisdiction to jurisdiction;

- The rate of complaints relating to environmental noise emissions from residents living in the vicinity of operating wind farms is very low;

- There are complaints relating to environmental noise emissions from residents living in the vicinity of operating wind farms. These complaints generally relate to concerns regarding low frequency noise and health related impacts; and

- There is detailed and extensive research and evidence that indicates that the noise from wind farms developed and operated in accordance with the current Standards and Guidelines will not have any direct adverse health effects.

THE NOISE FROM A WIND FARM

The acoustic energy generated by a wind turbine is of a similar order to that produced by a truck engine, a tractor, a large forklift or a range of typical earthmoving equipment. However, a wind turbine is a stationary source that operates in conjunction with other turbines in a generally windy environment, is located high above the ground and has different noise characteristics compared to these other noise sources.

This section provides information relating to the level and characteristics of noise from a wind farm.

Noise is inherently produced by moving elements. There are two main moving elements that generate the environmental noise from a wind turbine, being the external rotating blades and the internal mechanical components such as the gearbox and generator.

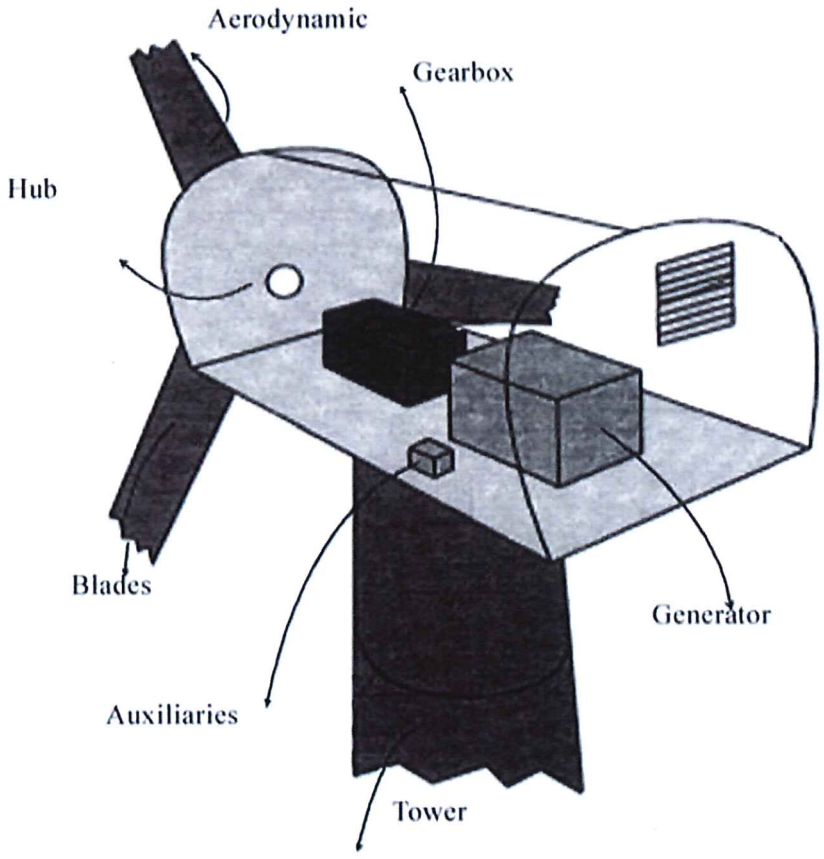

Figure 1 - (Modified from Wagner 1996)

The noise from the blades and the internal machinery are commonly categorised as aerodynamic and mechanical noise respectively.

Mechanical Noise

Mechanical noise sources are primarily associated with the electrical generation components of the turbine, typically emanating from the gear box and the generator. Mechanical noise was audible from early turbine designs. On modern designs, mechanical noise has been significantly reduced (Moorhouse et al., 2007), such that aerodynamic noise from the blades is generally the dominant noise emission from a wind turbine.

Aerodynamic Noise

Aerodynamic noise typically dominates the noise emission of a wind turbine and is produced by the rotation of the turbine blades through the air.

Turbine blades employ an airfoil shape to generate a turning force. The shape of an airfoil causes air to travel more rapidly over the top of the airfoil than below it, producing a lift force as air passes over it. The nature of this air interaction produces noise through a variety of mechanisms (Brooks et al., 1989).

In general terms, the noise we hear in any environment is a combination of energy at different frequencies. There are noise sources that have their dominant content of energy present in the higher frequencies, such as a whistle, and noise sources that have their dominant content in the low frequencies, such as a diesel locomotive engine. Most noise sources are "broadband" in nature; that is they possess energy in all frequencies. A typical broadband noise is music, where the bass content is in the low frequency region, and the voices and general melody are in the middle and higher frequencies.

Aerodynamic noise is broadband in nature and present at all frequencies. Weighting networks are applied to measured sound pressure levels to adjust for certain characteristics. The A-weighting network (dB(A)) is the most common, and it is applied to simulate the human response for sound in the most common frequency range. Therefore, the A-weighted network (dB(A)) is the network used in wind farm standards and guidelines.

Aerodynamic noise can be further separated into the following categories, generally termed "characteristics":

Amplitude Modulation

Amplitude modulation is most commonly described as a "swish" (Pedersen, 2005). "Swish" is a result of a rise and fall in the noise level from the moving blades. The noise level from a turbine rises during the downward motion of the blade. The effect of this is a rise in level of approximately once per second for a typical three-bladed turbine as each blade passes through its downward stroke.

It was previously thought that "swish" occurred as the blade passed the tower, travelling through disturbed airflow, however, a recent detailed study indicates it is related to the difference in wind speed over the swept area of a blade (Oerlemans and Schepers, 2009).

Other explanations for the rise in noise level that occurs on the downward stroke relate to the slight tilt of the rotor-plane on most modern wind turbines to ensure that the blades do not hit the tower. An effect of the tilt is that when the blades are moving downwards they are moving against the wind. Conversely, when moving upwards they are moving in the same direction as the wind. Therefore, with the effective wind speed being higher on the downward stroke, it is suggested that a higher noise level is produced (Sloth, 2010).

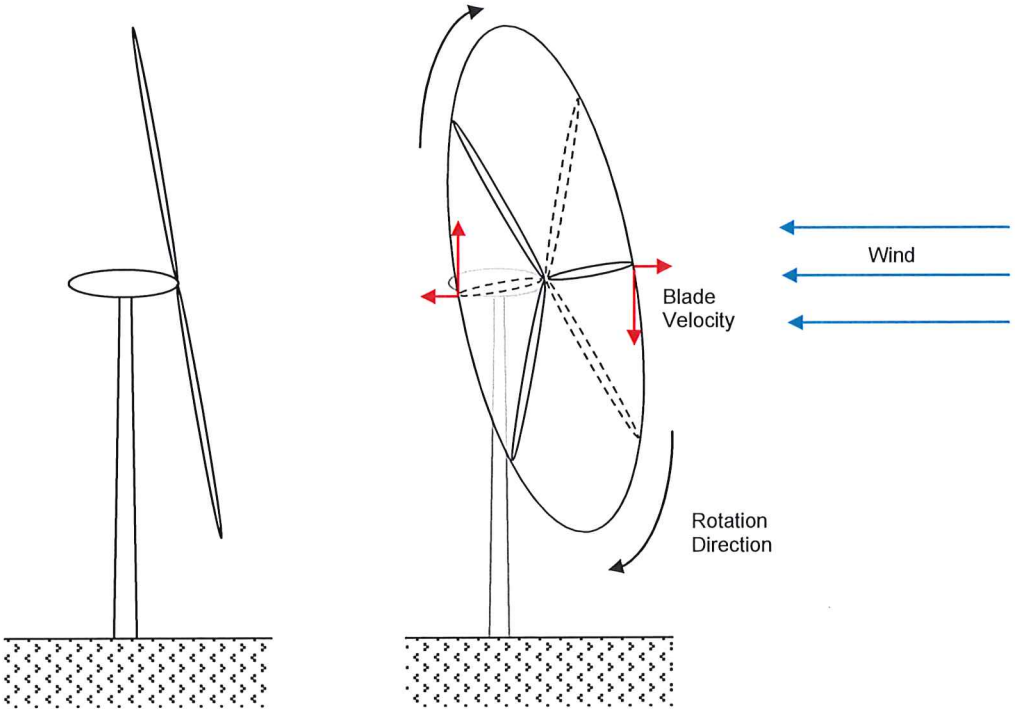

Figure 2 - Blade Velocity due to Tilt

Low Frequency Noise

Noise sources that produce low frequency content, such as a freight train locomotive or diesel engine; have dominant noise content in the frequency range between 20 and 200 Hz (O'Neal et al, 2009). Low frequency noise is often described as a "rumble".

Aerodynamic noise from a wind turbine is not dominant in the low frequency range. The main content of aerodynamic noise generated by a wind turbine is often in the area known generically as the mid-frequencies, being between 200 and 1000Hz.

Noise reduces over distance due to a range of factors including atmospheric absorption. The mid and high frequencies are subject to a greater rate of atmospheric absorption compared to the low frequencies and therefore over large distances, whilst the absolute level of noise in all frequencies reduces, the relative level of low frequency noise compared to the mid and high frequency content increases. For example, when standing alongside a road corridor, the mid and high frequency noise from the tyre and road interaction is dominant, particularly if the road surface is wet. However, at large distances from a road corridor in a rural environment, the remaining audible content is the low frequency noise of the engine and exhaust.

This effect is exacerbated in an environment that includes masking noise in the mid and high frequencies, such as that produced by wind in nearby trees.

A typical separation distance between wind farms and dwellings is of the order of 1000m. At similar distances, in an ambient environment where wind in the trees is present, it is possible that only low frequencies remain audible and detectable from a noise source that produces content across the full frequency range. This effect will be more prevalent for larger wind farms because the separation distances need to be greater in order to achieve the relevant noise standards. A greater separation distance changes the dominant frequency range from the mid frequencies at locations close to the wind farm to the low frequencies further away, due to the effects described above.

The low frequency content of noise from a wind farm is easily measured and can also be heard and compared against other noise sources in the environment. Low frequency sound produced by wind farms is not unique in overall level or content and it can be easily measured and heard at a range of locations well in excess of that in the vicinity of a wind farm. The C-weighting network (dB(C)) has been developed to determine the human perception and annoyance due to noise that lies within the low frequency range.

Infrasound

Infrasound is generally defined as noise at frequencies less than 20 Hz (O'Neal et al., 2009). The generation of infrasound was detected on early turbine designs, which incorporated the blades 'downwind' of the tower structure (Hubbard and Shepherd 2009). The mechanism for the generation was that the blade passed through the wake caused by the presence of the tower.

Audible levels of infrasound have been measured from downwind blade wind turbines (Jakobsen, J., 2005). Modern turbines locate the blades upwind of the tower and it is found that turbines of contemporary design produce much lower levels of infrasound (Jakobsen, J., 2005), (Hubbard and Shepherd 2009).

Infrasound is often described as inaudible, however, sound below 20 Hz remains audible provided that the sound level is sufficiently high (O'Neal et al, 2009). The thresholds of hearing for infrasound have been determined in a range of studies (Levanthall, 2003).

Non-audible perception of infrasound through felt vibrations in various parts of the body is not possible for levels of infrasound that are below the established threshold of hearing and only occurs at levels well above the threshold (Moeller and Pedersen, 2004).

Weighting networks are applied to measured sound pressure levels to adjust for certain characteristics. The A-weighting network (dB(A)) is the most common, and it is applied to simulate the human response for sound in the most common frequency range. The G-weighting has been standardised to determine the human perception and annoyance due to noise that lies within the infrasound frequency range (ISO 7196, 1995).

A common audibility threshold from the range of studies is an infrasound noise level of 85 dB(G) or greater. This is used by the Queensland Department of Environment and Resource Management's (DERM's) draft Guideline for the assessment of low frequency noise as the acceptable level of infrasound in the environment from a noise source to protect against the potential onset of annoyance and is consistent with other approaches, including the UK Department for Environment, Food and Rural Affairs (DEFRA., Leventhall, 2003).

Whilst the aerodynamic noise from a rotating turbine blade produces energy in the infrasound range, measurements of infrasound noise emissions from modern upwind turbines indicates that at distances of 200 metres, infrasound is in the order of 25 dB below the recognised perception threshold of 85 dB(G) and other similar recognised perception thresholds (Hayes Mckenzie Partnership Ltd, 2006). A 25 dB difference is significant and represents at least a 100 fold difference in energy content. Infrasound also reduces in level when moving away from the source, and separation distances between wind farms and dwellings are generally well in excess of 200m.

Notwithstanding the above, there are natural sources of infrasound including wind and breaking waves, and a wide range of man-made sources such as industrial processes, vehicles and air conditioning and ventilation systems that make infrasound prevalent in the natural and urban environment (Howe, 2006).

Future Designs

A wind turbine converts wind energy into rotational energy (which in turn becomes electricity) and acoustic energy. An efficient wind turbine converts more of the wind energy into rotational energy with all other factors, such as blade angles, being equal. Therefore, it is in the best interests of wind turbine manufacturers to research and make available quieter turbines, as this indicates an increase in the available electricity generating capacity as well as the benefits of lower noise levels:

> *The sound produced by wind turbines has diminished as the technology has improved. As blade airfoils have become more efficient, more of the wind energy is converted into rotational energy, and less into acoustic energy. Vibration damping and improved mechanical design have also significantly reduced noise from mechanical sources.*
> *(Rogers et al, 2006)*

STANDARDS AND GUIDELINES

Australia presently assesses the noise from wind farms under a range of Standards and Guidelines applicable to each individual State or Territory, shown below in Table 1

Table 1 – Summary of Australian State Standards and Guidelines for Wind Farms

State or Territory	Assessment Procedure	Comments
South Australia	SA EPA Wind Farms Environmental Noise Guidelines July 2009	The 2009 Guidelines is an updated version of the original 2003 Guidelines. The release follows a review process initiated in 2006
New South Wales	SA EPA Wind Farms Environmental Noise Guidelines February 2003	New South Wales has not automatically endorsed the 2009 version of the Guidelines, and at this stage retains the 2003 version as the primary assessment procedure.
Western Australia	SA EPA Wind Farms Environmental Noise Guidelines February 2003	The document EPA Guidance for the Assessment of Environmental Factors No. 8 – Environmental Noise Draft May 2007 refers to the 2003 version as the primary assessment procedure. The WA Government has not endorsed the 2009 version of the Guidelines at this stage.
Queensland	No formal assessment procedure	The New Zealand Standard and the South Australian 2003 Guidelines have been referenced by the Queensland Government in the past.
Victoria	New Zealand Standard NZS 6808:1998 *Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators*	The document Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria refers to the 1998 version of the New Zealand Standard as the primary assessment procedure. The 2010 version of the Standard has not been endorsed in the Guidelines at this stage.
Tasmania	Department of Primary Industries, Water and Environment (Tasmania) *Noise Measurement Procedures Manual 2004*	The document does not provide objective criteria and therefore the use of one of the assessment procedures noted for the States above will be required in conjunction with the 2004 Manual.
ACT and Northern Territory	No formal assessment procedure	To be assessed on a case by case basis.

In addition to the above, Australian Standard AS4959 – 2010 *Acoustics – Measurement, prediction and assessment of noise from wind turbine generators* has been released recently. The Standard does not provide any objective criteria, but rather it aims to provide a suitable framework to develop a method for the measurement, prediction and assessment of noise from wind farms.

Based on the above, a wind farm proposal could be subject to a range of assessment procedures depending on the jurisdiction. Whilst there are consistent elements in the different procedures, there are inherent and important discrepancies.

Objective Standards

In general terms, the noise from a wind farm increases with wind speed up until the rated power (electrical output capacity) of the particular turbine, when the noise then remains constant or even reduces at higher wind speeds. The increase in wind turbine noise as the wind speed increases normally plateaus, or even potentially diminishes, occurs in an environment where the background noise level continues to increase, the effect of which is to assist in masking the wind farm noise.

Therefore, wind farm standards and guidelines in Australia and New Zealand set a base noise limit that generally applies at lower wind speeds when the background noise is relatively low, and a background noise related limit that allows the wind farm to generate higher noise levels as the wind speed increases.

In circumstances where the background noise levels are sufficiently low, the base noise limit applies. This generally occurs at lower wind speeds and/or at dwellings that are not subject to a sufficiently high background noise environment, such as might occur at a dwelling deep in a valley with little to no surrounding vegetation.

In circumstances where the background noise levels increase sufficiently, the background noise related limit applies. This generally occurs at higher wind speeds and/or at dwellings that are subject to a high background noise environment, such as might occur at a dwelling on a ridge top surrounded by trees.

Where the wind farm is able to achieve the base line noise limit at higher wind speeds, the masking effect of the background noise environment does not need to be taken into account. This is because the base line noise limit is generally established to ensure there are no adverse noise impacts, even in a low background noise environment when the masking effects are limited.

The objective standards provided by the various assessment procedures is summarised in the table below:

Table 2 - Objective Standards

Assessment Procedure	Objective Standard	Comments
Government of South Australia Wind Farms Environmental Noise Guidelines February 2003	Base noise limit: 35 dB(A) Background noise limit margin: 5 dB(A). The greater of the above limits applies.	The limits are an equivalent (or effectively an average) noise level.
Government of South Australia Wind Farms Environmental Noise Guidelines July 2009	Base noise limit: 35 dB(A) (Rural living locality) Base noise limit: 40 dB(A) (in other localities including general farming and rural areas) Background noise limit margin: 5 dB(A). The greater of the above limits applies.	The base noise level limit has been increased to 40 dB(A) to ensure consistency with the assessment limits applied by the *South Australian Environment Protection (Noise) Policy 2007* to other noise sources in a general farming or rural locality.
New Zealand Standard NZS 6808:1998 *Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators*	Base noise limit: 40 dB(A) Background noise limit margin: 5 dB(A). The greater of the above limits applies.	Whilst there is conflicting information in the Standard, the limits are taken to be an equivalent noise level.

Assessment Procedure	Objective Standard	Comments
New Zealand Standard NZS 6808:2010 *Acoustics – Wind Farm Noise*	Base noise limit: 35 dB(A) (High amenity area) Base noise limit: 40 dB(A) (Other areas) Background noise limit margin: 5 dB(A). The greater of the above limits applies.	The limits are expressed explicitly in the Standard to be a 90th percentile level (L_{A90}). The L_{A90} is inherently less than the equivalent noise level and therefore the limits are higher (less stringent) than those in the South Australian Guidelines. A high amenity area is related to a review of the planning system and the specific requirement in the relevant plan to maintain a high degree of protection to the "sound environment". If the area is deemed to be of high amenity, then the L_{A90} 35 dB(A) base noise level limit applies only during the night period, and for wind speeds less than 6 m/s or other defined threshold for that specific proposal.
Australian Standard AS4959 – 2010 *Acoustics – Measurement, prediction and assessment of noise from wind turbine generators*	Deferred to the relevant jurisdiction.	Notes that the jurisdiction should have a base noise level limit and a background noise level limit.
Environment Protection Heritage Council (EPHC) prepared Draft National Guidelines October 2009 and July 2010	Deferred to the relevant jurisdiction.	Notes that the jurisdiction should have a base noise level limit and a background noise level limit.

Comparison of the objective standards with International approaches

The objective standards provided by a range of International assessment procedures is summarised in the table below (Reference 1 unless noted otherwise):

Table 3 – Summary of International Standards

Assessment Procedure Country of Origin	Objective Standard	Comments
Sweden	Base noise limit: 40 dB(A) Low background areas: 35 dB(A)	The approach does not provide a definition for a low background area.
Denmark	Noise limit: 44 dB(A) @ 8m/s 42 dB(A) @ 6m/s For sensitive areas such as institutions, allotment gardens and recreation: Noise limit: 39 dB(A) @ 8m/s 37 dB(A) @ 6m/s	No background noise limit is applied. The noise limits are determined for wind speeds taken at 10m above the ground.
France	Background noise limit margin: 5 dB(A) – day time Background noise limit margin: 3 dB(A) – night time	Based on a background noise measurement made at a wind speed of 8m/s
The Netherlands	Noise limit: 40 dB(A) at night increasing incrementally up to 50 dB(A) at 12m/s	

Assessment Procedure Country of Origin	Objective Standard	Comments
United Kingdom	Base noise limit: 40 dB(A) (day time) Base noise limit: 43 dB(A) (night time) Background noise limit margin: 5 dB(A). The greater of the above limits applies.	The limits are a 90th percentile level (L_{A90}). The L_{A90} is inherently less than the equivalent noise level. The UK assessment procedure indicates the L_{Aeq} from a wind farm is typically of the order of 2 dB(A) greater than the L_{A90} The procedure notes that the recommended noise levels take into account "swish".
USA (Illinois) (Reference TD178-01F06)	Base noise limit: 55 dB(A) (day time) Base noise limit: 51 dB(A) (night time)	The noise limits are determined for an 8 m/s wind speed taken at 10m above the ground. There are no uniform noise standards in the USA, with local counties establishing their own approaches which vary considerably.

In broad terms, the Standards and Guidelines used in Australian jurisdictions include the following common elements:

- Objective standards that provide a base noise limit and a background noise related limit, with the exception of the EPHC draft Guidelines and the Australian Standard;
- A background noise and wind speed measurement procedure to determine the applicable background noise related limits at each dwelling;
- A noise level prediction methodology to enable a comparison of the predicted noise level from the wind farm against the noise limits at each dwelling;
- The required adjustments to the predicted noise levels to account for any special audible characteristics of the wind farm noise;
- A compliance checking procedure to confirm the operational wind farm achieves the predicted noise levels at each dwelling.

In addition, Australian jurisdictions are amongst the most stringent and the most contemporary in the World.

Noise Levels

A common issue for people considering the environmental noise from wind farms is the ability to place the wind farm's noise levels and characteristics in context compared to the ambient environment.

A site visit to an operating wind farm at different times and at typical separation distances between a wind farm and a dwelling, starting from the order of 700m from the nearest turbine, greatly assists in providing this context.

To assist in providing context for typical noise levels from a wind farm, Chart 1 (below) provides the order of noise level in the vicinity of a modern wind turbine. It should be noted that the noise levels presented in the chart will vary according to a range of variables discussed in further detail in the noise propagation section of this Paper.

The base noise level requirement of 35 or 40 dB(A) provided in the main assessment tool in Australia, the South Australian EPA Wind Farm Guidelines, represents a low (stringent) noise level in an environmental noise context. It is significantly more stringent than the World Health Organisation's recommended guideline value of 45 dB(A) for sleep disturbance effects and than the recommended noise levels for road or rail infrastructure development that might occur in a rural environment, where levels of the order of 55 and 60 dB(A) respectively are typically recommended.

The base noise level requirements also need to be considered in the context of the ambient environment. Wind farms are generally located in a rural environment, where the associated planning system often envisages and promotes activity associated with primary industry.

A wind farm is also inherently located in areas where wind is present and therefore background noise levels from wind in the trees and around structures such as houses and sheds can be elevated. The effect of elevated background noise levels is to provide masking of other noise sources in the environment.

Regardless of the stringency of the base noise level or the available masking effect of the ambient environment, wind farm standards and guidelines are not established to ensure inaudibility. The ability to hear a wind farm designed and operated in accordance with the standards and guidelines in Australia will vary according to a range of variables such as the influence of the ambient environment, the local topography, the distances involved and the weather conditions at the time.

All noise, from any noise source including wind farms, which is audible, will result in complaints from some people. In addition, recent research indicates the potential for complaints, annoyance and its associated stress and health impacts may be exacerbated by rhetoric, fears and negative publicity (Colby et al, 2009). There is a significant amount of mis-information and negative publicity about the impacts of wind farms available in the broader community.

Only a few field studies on noise annoyance among people living close to wind turbines have been conducted and further investigations have been recommended by these studies. The European studies (Pedersen, 2005) indicate correlation between the noise level and annoyance, but stronger correlation with factors such as overall sensitivity to noise, attitude towards the noise source, attitude towards the area as a pristine place or a place for economic development, influence over the proposal, daily hassles, visual intrusion and the age of the turbine site.

Tickle (2006) compared the incidence of complaints in Australia and New Zealand, about noise from wind farms and complaints about noise in general and found that once wind farms are built the rates of complaints are very low in Australia and New Zealand.

Notwithstanding the above reasons or information, if a noise source can be heard, then annoyance can result for some people, regardless of the noise level or the standard or guideline that applies.

Figure 3 below provides some relative noise level information and compares wind turbines against common community noise levels:

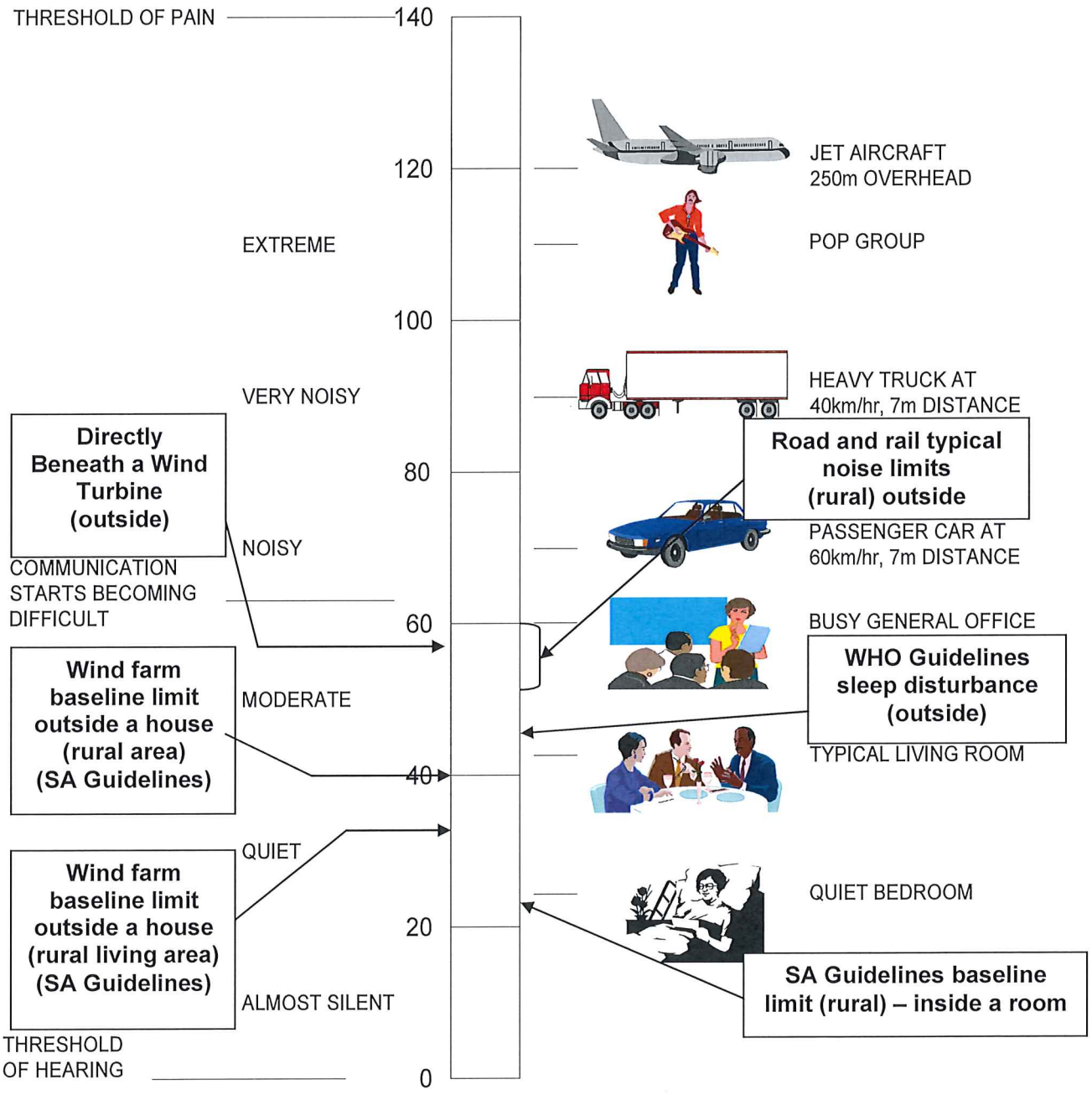

Figure 3 – Subjective Comparison of Noise Levels

ASSESSMENT METHODOLOGY

Whilst each Australian jurisdiction is subject to its own Standards and Guidelines and associated detailed requirements, the broad methodology for an environmental noise assessment of a wind farm proposal is similar amongst jurisdictions.

This section of the Technical Paper provides the background to the assessment process to assist in interpretation and understanding of the technical information that will generally be provided as part of a wind farm proposal and assessment.

Environmental Noise Assessment

Noise is often the most important factor in determining the separation distance between wind turbines and sensitive receivers. The assessment of noise therefore plays a significant role in determining the viability of and the size of wind farms.

The developer of a wind farm makes an assessment of the environmental noise from the proposed layout and to determine any necessary modifications to ensure compliance with the relevant Standard and Guidelines. The modifications during the planning and design phase of the project might comprise the removal or relocation of some turbines or the operation of certain turbines at reduced speeds or "modes" that correspond to lower noise levels. The assessment is generally made by an independent acoustic engineer specialising in the prediction and assessment of noise and vibration impacts across a broad range of sectors, including wind farms.

Methodology

The broad methodology associated with an environmental noise assessment of a wind farm proposal is as follows:

1. Review the proposed layout to identify dwellings where the relevant criteria might be exceeded;

   The purpose of the identification is to determine the locations at which background noise monitoring will be conducted.

   The background noise monitoring is a measurement method used to establish the existing ambient noise environment at a dwelling. The technical definition of the background noise is the noise level that is exceeded for 90% or 95% of the measurement period. In subjective terms, it represents the "lulls" that occur in the environment, in between intermittent events such as the overhead passage of an aircraft, a dog barking, wind gusts in trees, or the occasional passing of a vehicle on a nearby road. This is because the background noise excludes all noise level data that is not present for at least 90% (or 95% depending on the Standard or Guideline used) of the time. A common term used in the assessment is the "ambient" noise. The ambient noise is generally taken to include all the intermittent events, whilst the background noise effectively removes these events and represents the noise environment in their absence.

   The background noise at a dwelling is important because it can mask the noise of a wind farm, and the level of that masking can be an important factor in the assessment. The most general source of background noise level masking, particularly at higher wind speeds, is wind in nearby trees.

   The land owners who have a turbine on their land are also identified during this process, as the assessment criteria applied to them are relaxed by most Standards and Guidelines in comparison to dwellings without an association with the proposed wind farm.

Land holdings where a development approval exists to construct a dwelling are also generally identified as most Standards and Guidelines define these as locations where the relevant criteria need to be met.

Once those dwellings and land holdings are identified, the locations that best represent the range of dwellings in the locality are selected. These are generally defined as dwellings that are closest to the wind farm. The Standards and Guidelines generally allow a single dwelling to represent a range of dwellings that are either in the near vicinity or expected to be subject to a similar background noise environment.

A term that is commonly used in the Standards and Guidelines is "relevant receiver location". These locations are generally:

- Where someone resides or has development approval to build a dwelling; and
- Where the predicted noise level exceeds the base noise level for wind speeds up to the rated power of the wind turbine; and
- Representative of the worst case location when considering the range of dwellings, such as a dwelling that is located amongst a similar group in the near vicinity and is the closest to the wind farm.

2. <u>Conduct a background noise monitoring regime at the relevant receiver locations;</u>

The measurement of background noise levels is a critical aspect of the environmental noise assessment as it is the method by which criteria are determined.

The exception to the need to conduct a background noise monitoring regime is in circumstances where the wind farm is able to achieve the base noise level limit (or a prescribed noise level that is less than the base noise level) at wind speeds where the noise output of the particular turbine is at its maximum. This is because the base noise level limit is generally established to ensure there are no adverse impacts even in a low background noise environment where the masking effect is limited or negligible.

Notwithstanding compliance with the base noise level limit, a background noise monitoring regime may still be conducted as it the means by which compliance checking procedures are generally based upon. The compliance checking procedure is discussed in further detail in a dedicated section below.

Where conducted, the background noise monitoring can be over a range of the order of 10 days to 4 weeks, depending on the particular requirements of the relevant Standard or Guideline. The period of monitoring can also be extended where excessive wind or rain adversely affect the data. The apparatus used to continually measure and record the background noise levels over this period is known as a "logger".

The location of the logger is typically at least 5m from the building facade to remove the effects of large reflecting surfaces. The location is also required to be representative of background noise levels and this is generally achieved by placing the logger at an equivalent distance to tall trees as the facade of the house. The logger is also generally placed on the windfarm side of the dwelling to enable any future compliance checking measurements at dwellings to be taken at the same point.

Photographs and a GPS grid reference are typically used to identify each noise logging location. A typical installation is shown in Figure 4 below. The noise logger, comprising a sound level meter and batteries within a weatherproof container connected to a pole mounted microphone, is located in the centre of the photograph.

Figure 4 – Typical Noise Monitoring Installation

Some Standards and Guidelines explicitly require the removal of adverse data and data outside of the wind speed operating range of the turbines and it is considered good practice to do so. The 2003 and 2009 SA Guidelines require data points where rain has occurred and when wind on the microphone has had an impact on the measured noise levels to be removed. A way of measuring the occurrence of these factors is to place a weather logger adjacent to one of the background noise loggers to record rainfall, wind speed and wind direction. If in close proximity, a local Bureau of Meteorology weather station can also be used to identify adverse weather periods.

An acoustic engineer would take of the order of one hour to set up the noise logging equipment at each location. Access is normally organised directly with the land holder or dwelling occupier in accordance with established project protocols. Clearly, a land holder or occupier does not need to grant access to their property, however, an advantage of doing so is the ability to confirm compliance, or otherwise, of the operational wind farm against the relevant Standards or Guidelines at a point in the future.

3. Analyse the background noise monitoring data to determine the noise level criteria;

Following the removal of data adversely affected by local weather conditions, the remaining data points are correlated against the wind speed collected at the same time and for the same period as the background noise levels. The background noise level is determined for every ten minute period throughout the 2 to 4 week monitoring regime.

The wind speed is measured by the developer or another independent expert at a representative location within the wind farm by erecting a wind mast with anemometers, sometimes at a number of different heights. There may be more than one wind mast depending on the size of a wind farm.

Earlier Standards and Guidelines required the wind speed to be measured at 10m above the ground, however, recent requirements relate to measurements at or near the proposed hub height of the wind turbine, which may be of the order of 80m above the ground. The reason for the 10m measurement height was to provide correlation with the way the sound power level of a wind turbine is measured in accordance with IEC 61400 – 11 (IEC, 2002)[1], whereas the increase to at or near hub height has been introduced to better represent actual operating scenarios.

The purpose of the correlation of the two sets of data, being the wind speed measured at the wind farm site (data set one) and the background noise levels measured at a relevant receiver (data set two), is to establish the relationship between the operating wind farm and the average background noise level at dwellings in the vicinity, and in turn, to determine the applicable criteria at those dwellings. That is, the correlated data will determine whether the wind farm will be operational during periods when the background noise levels are on average low, providing limited masking, or when the background noise levels are on average high, providing a greater level of masking.

A best fit regression analysis is conducted on the two sets of data. An example plot produced from background noise measurements is given in Figure 5 below.

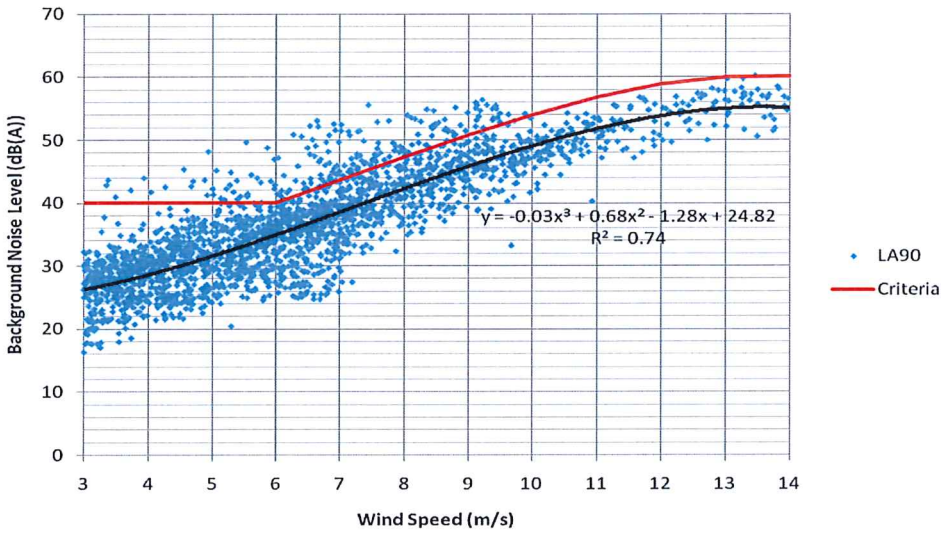

Figure 5 – Example Regression Analysis Plot

[1] An expected revision of the IEC standard will include reference to a hub height measurement position

Whilst most regression analyses will show the trend of the background noise level increasing with an increasing wind speed at the wind farm, the analyses will vary for each individual dwelling. Figure 5 shows a strong relationship between the background noise level and the wind speed at the wind farm, but this will not be the case in all circumstances. Some dwellings may be located such that they are shielded from the effects of the wind at the wind farm site.

The red line in the figure shows how the correlated data is used to determine the applicable noise level criteria at a dwelling. In this example, the base noise level limit is 40 dB(A), and this is not increased until the average background noise level increases sufficiently to provide a suitable level of masking. In this example, the background noise level becomes suitably high at wind speeds at the wind farm site that are at and above 6 m/s.

An important feature of the regression analysis is that it represents a line of best fit or effectively an "averaging" of the data. Therefore, there will be times when the environment provides more masking than indicated by the line of best fit, and other times when the environment provides less masking.

4. Predict the noise level from the proposed wind farm;

The prediction of noise from a wind farm can be made at any location from a range of available models, and the various Standards and Guidelines provide flexibility with respect to the selection of that model and the assumptions that are made.

In broad terms, the most basic noise models determine the noise level at a location based on the acoustic energy of the noise source, in this case the wind turbine, and the attenuation of noise over distance. These types of noise models do not account for other attenuation factors such as ground absorption, meteorological effects and screening due to ground contours and as such are considered to be inherently conservative (predicting higher noise levels than expected in situ). Basic models are often used by developers to establish a preliminary layout of a wind farm. The more complex and refined models include attenuation due to the factors noted above.

Wind Turbine Sound Power Levels for input to the noise model

The acoustic energy of the noise source is commonly termed the "sound power level", and for wind turbines it is determined in accordance with the International Standard IEC 61400-11 "Wind turbine generator systems – Part 11: Acoustic noise measurement techniques". The sound power level is generally provided for each integer wind speed ranging from the speed that the turbine "cuts in" for operation through to the speed at which it approaches its rated power. The sound power level increases with wind speed and then remains constant or even reduces in higher wind speeds. The sound power level is a constant that does not alter with location for a given wind speed.

The final selection of the wind turbine to be used at a site is typically subject to a competitive tendering process. The tendering process generally occurs in the design and development phase of the project after project approval is granted. This is consistent with a range of other industries and sectors, where plant and equipment contracts are not finalised until after project approval is granted, when all conditions of that approval are known and commitments to outlay significant capital cost can be made.

In addition, lead times between the project approval and procurement stage of a major project can be over a period of years, in which time there may be changes in the turbine models, their available technology and their noise levels. Therefore, it is common practice that noise assessments conducted for the purposes of project approval are made based on representative turbines, rather than a final selection.

The selection of the representative turbines is often made by the proponent or by the proponent in conjunction with an acoustic engineer, to ensure the turbines used are representative of the final turbine selection.

It is in the best interest of a proponent in any major wind farm project to select representative turbines for noise assessment purposes during the project approval stage, as any approval granted is likely to result in conditions and site constraints based on that selection and subsequent assessment. These constraints need to provide sufficient flexibility to invite a range of suppliers to tender for the project as part of a competitive process during the design development and documentation stage of a project.

It is a common arrangement for the wind turbine manufacturer to guarantee a sound power level of a particular make and model of a turbine to a wind farm developer. This guarantee is then confirmed in situ repeating the methodology provided by the International Standard (IEC, 2002).

Attenuation factors for input to the noise model

The attenuation factors are generally chosen to represent the "worst case" situation, such as assuming that the wind is blowing from the turbine to the dwellings or "downwind", however, there is flexibility in the Standards and Guidelines with respect to the factors used for inputs to the models, provided the rationale for these inputs is included in the assessment. Ultimately, the selection of the model and its input factors must be conservative enough to ensure compliance of the operational wind farm. A requirement to conduct a "compliance checking" procedure is included in the Standards and Guidelines used in Australia.

A typical approach to the modeling process is to conduct initial predictions with a simple model that provides a preliminary estimate of the noise. This assists in confirming the proposed background noise logger locations and the preliminary wind farm layouts. These initial predictions are then refined after the background noise monitoring has been completed with a more complex model. In Australia, this is typically either the CONCAWE or ISO-9613 noise propagation model using conservative assumptions.

Joule (*Reference*) has conducted a study of the accuracy of the ISO-9613 model as it relates to wind farms and found that:

> *The accuracy of output from the ISO model is impressive. Agreement with sound pressure levels measured under conditions of an 8 m/s positive vector wind speed has been measured to within 1.5dB(A) on flat, rolling and complex terrain sites.*

As with any model, the accuracy is subject to its inputs which are summarised in the Joule Paper (Bass et al, 1998*)* and in other summary works (Bowdler et al, 2009). These include the temperature and humidity to be used, how hard or soft the ground should be taken to be, the relative height of the receiver and the amount of "barrier" attenuation that should be applied to the ground contours.

Provided these inputs are applied to the ISO 9613 model, the Joule study found that the calculated sound pressure levels are validated to agree to within 2dB(A) of noise levels measured under practical 'worst case' conditions at distances of up to 1000m from a noise source, and that due to the

> *observed scatter of measured sound pressure levels under these same conditions, ….. an 85% level of confidence can be placed on the noise levels measured in practice not exceeding the calculated level by more than 1dB(A).*

A 1 dB(A) difference is negligible in terms of perception.

The ISO 9613 model assumes that a receiver is downwind from all wind turbines. In some circumstances such as where the turbines are on opposite sides of a dwelling but at similar distances this will provide a conservative outcome (a predicted noise level higher than that expected in situ). The Standards and Guidelines used in Australia therefore provide the flexibility to use other models that account for an upwind scenario.

5. Compare the predicted noise levels with the criteria;

A comparison is made between the predicted noise levels and the noise level criteria established by the background noise monitoring regime. This comparison is made for each integer wind speed, generally within the operating range of the wind turbine.

Where the predicted noise levels achieve the criteria, then the process and results are summarised in a report suitable for submission to the relevant authority. The extent of information provided in the reports is summarised in Step 6 below.

Where the predicted noise levels do not achieve the criteria, then mitigation options are considered. The options considered will depend on the number of locations the criteria are exceeded at, the difference between the predicted noise level and the criteria, and the number of integer wind speeds at which the predicted noise level exceeds the criteria. The mitigation options include:

- The operation of wind turbines under reduced noise level modes for particular conditions;
- The consideration of alternative turbines with lower sound power levels;
- The adjustment of the wind turbine layout;
- The consideration of removing turbines from the layout.

An example is provided for a dwelling in a low background noise environment:

- *Due to the background noise levels being low on average at the closest dwelling to the proposed wind farm over the required monitoring period, the baseline noise limit applies at all operating wind speeds. In this example, the dwelling is located in a general farming area and the baseline limit is 40 dB(A);*
- *The highest sound power level from the representative turbine selection occurs at a hub height wind speed of 10m/s;*
- *The predicted noise level at wind speeds of 10m/s or greater is 43 dB(A) at the closest dwelling and therefore exceeds the noise level criterion of 40 dB(A);*
- *The options available to reduce the predicted noise level by 3 dB(A) include:*
    1. *Adjusting the layout of the closest turbines to the dwelling;*
    2. *Operating the closest 4 turbines to the dwelling in a low noise mode at wind speeds of 10m/s or greater. This is only required to occur under downwind conditions (wind from the turbines to the dwelling), as the model shows that under upwind conditions (wind from the dwelling to the turbines) the wind farm complies with the baseline limit, even at full mode operation;*
    3. *Selecting an alternative wind turbine with a lower sound power level.*
    4. *Removing the closest turbine to the dwelling.*
- *Of the above, Option 2 is selected, due to the flexibility it provides in the future competitive tendering process for the final wind turbine selection, and the ability of contemporary turbine control systems to implement an operating strategy where certain turbines can be operated in certain "modes" under specific operating conditions like wind speed and/or wind direction.*

Once the predicted noise levels achieve the environmental noise criteria at each relevant receiver and for each operational wind speed, a summary report is prepared that is suitable for submission to the relevant regulatory authority.

6. Prepare a report suitable for submission to the relevant regulatory authority;

A report is prepared by the developer that summarises the above five steps. In general terms, the report would typically provide the following information, subject to the particular requirements of the regulatory authority assessing the development proposal:

- Background noise measurement locations;
- Time and duration of the background noise monitoring regime;
- Wind speed monitoring locations and heights above ground;
- Graphical correlation plot of the wind speed versus background noise level data;
- A summary of the environmental noise criteria for the project at each integer wind speed based on the correlation;
- The make and model of the representative wind turbine/s;
- The positions of the wind turbines;
- The model used to predict the wind farm noise levels;
- The input assumptions and factors used in the model;
- The predicted noise levels at the closest dwellings to the wind farm at each integer wind speed;
- A comparison of the predicted noise levels against the criterion at each integer wind speed for the closest dwellings to the wind farm;
- The modifications or operating strategy required to ensure compliance with all noise criteria for all wind speeds and at all locations;
- A comparison of the predicted noise levels against the criteria at each integer wind speed for the closest dwellings to the wind farm, showing compliance with the proposed modification or operating strategy in place.

The above six steps provide an overview of the typical assessment methodology. The following information provides frequently asked questions during the preparation and finalisation of such an assessment.

Separation Distances

A common request from the surrounding community is to provide a set separation distance between the wind farm and the nearest dwelling.

Where an objective assessment method is used as outlined above, there is no set distance that could be applied with equity to every wind farm. This is because of the range of factors that affect the predicted and the resultant operational wind farm noise level. These factors include the number of turbines, their locations relative to the dwelling, the sound power level of the turbine, the topography between the turbines and the dwelling, the existing background noise environment at the dwelling and the resultant criteria applied by the relevant Standards and Guidelines.

Separation distances between wind farms and dwellings can be of the order of 800 to 1200m. These separation distances will change according the above factors. The separation distances are related to the stringency of the assessment criteria within the relevant Standards and Guidelines.

Assessment Process

An environmental noise assessment for a wind farm needs to contain significant detail to show compliance with Australian jurisdiction's Standards and Guidelines.

As with all assessments, there might be areas that are contended to be at variance with the requirements of those Standards and Guidelines.

Each State Jurisdiction will have its own specific rules with respect to the ability to appeal in situations where the parties do not agree that the assessment provides the necessary information or where a decision of the relevant regulatory authority is in dispute.

A number of wind farms have been considered in the environmental courts in their relevant jurisdictions, including:

- Taralga Landscape Guardians Inc vs Minister for Planning and RES Southern Cross Pty Ltd, NSW Land and Environment Court Proceedings No. 10196 of 2006;
- RES Southern Cross Pty Ltd v Minister for Planning (DOP) and Taralga Landscape Guardians Incorporated (TLG) NSW Land and Environment Court Proceedings No. 11216 of 2007;
- Epuron Pty Ltd & Gullen Range Wind Farm Pty Ltd & Ors vs Parkesbourne / Mummel Landscape Guardians Incorporated (PMLG), NSW Land & Environment Court Proceedings No. 41288 of 2008.

Judgments made in matters such as these provide important clarification in interpretation of the Standards and Guidelines or their general application and scope. Relevant outcomes from the above judgments include:

- An additional 5 dB(A) penalty for excessive amplitude modulation is not necessary when using the SA 2003 Guidelines. However, the application of acoustic treatment to the facades of dwellings in the vicinity might be a precautionary approach for the established presence of such excessive modulation;

- The heightened sensitivity of an individual to noise should not be taken into account in the assessment of a wind farm, but rather the objective and empirical methods of the

relevant Standards and Guidelines adopted by consent authorities and regulators should be relied upon.

The judgment relating to the heightened sensitivity of an individual is important and can be found at Paragraph 154 of the Gullen Range judgment as follows:

> *Inserting subjectivity consent requirements based on an individual's or a group of individuals' reaction to the noise from the wind farm, based on their opposition to the development, is entirely alien to the planning system. Whilst, in some areas such as streetscape impact, individual aesthetic considerations may arise and judgments made upon them, we are unaware of any authority to support the proposition that, where there is a rationally scientifically measurable empirical standard against which any impact can be measured and determined to be acceptable at a particular empirically determined level, that there should be some allowance made for a subjective response to the particular impact.*

Compliance Checking

The assessment process occurs well before a wind farm is operational. Therefore, to confirm compliance with the assessment criteria, a measurement procedure is conducted once the wind farm is operational.

The Standards and Guidelines in Australian jurisdictions all provide a methodology for noise level measurements of an operational wind farm.

The term commonly applied to these measurements is "compliance checking".

It is common for a planning or relevant regulatory authority to impose a condition of approval for a wind farm development that requires "compliance checking" and reporting thereon within a certain timeframe of commissioning the wind farm.

In general terms, compliance checking can effectively be a repeat of the background noise monitoring regime. The variations that are applied to the compliance checking procedure might include collecting a minimum number of noise level data points under downwind conditions. A comparison is then made of the noise environment before the wind farm and after the establishment and operation of the wind farm.

As wind farm assessments account for the masking effect of the ambient environment, there will be inherent difficulties in identifying the wind farm noise amongst other noise, in particular and most commonly, the background noise generated by wind in the trees. Therefore, compliance checking procedures generally provide a level of flexibility in the methodology, which might include turning the turbines on and off to determine their influence amongst other noise in the environment, or measuring at a location much closer to the wind farm, where the noise from the wind farm is more dominant in comparison to other noise in the environment.

TOPICS OF INTEREST

A range of topics of interest exist for wind farms that are raised by the community, by acoustic engineers, by health professionals, by the industry and by regulatory authorities.

The key topics to be addressed are those that relate to the health of the surrounding community.

There has been extensive research conducted into the relationship between noise levels and characteristics of wind farms and the potential for adverse health impacts, and the research overwhelmingly concludes that wind farm noise does not adversely impact on a person's health.

Health Effects

In 2009 the American and Canadian Wind Energy Associations established a scientific advisory panel comprising medical doctors, audiologists and acoustic professionals from the United States, Canada, Denmark and the United Kingdom to produce "an authoritative reference document for legislators, regulators, and anyone who wants to make sense of the conflicting information about wind turbine sound". (Colby et al, 2009)

The Panel concluded:

> *there is no reason to believe, based on the levels and frequencies of the sounds and the panel's experiences with sound exposures in occupational settings, that the sound from wind turbines could plausibly have direct adverse health consequences.*

The Victorian Department of Health (DH) (WorkSafe, 2010) has examined both the peer-reviewed and validated scientific research and concluded that

> *the weight of evidence indicated that there are no direct health effects from noise (audible and inaudible) at the levels generated by modern wind turbines.*

The Australian Government's National Health and Medical Research Council (NHMRC, 2010) has examined the "evidence from current literature on the issue of wind turbines and potential impacts on human health" and concludes:

> *There are no direct pathological effects from wind farms and that any potential impact on humans can be minimised by following existing planning guidelines (NHMRC, 2010).*

Notwithstanding the above, Dr Nina Pierpont (Pierpont, 2009) contends that adverse health outcomes are caused by wind farm noise and in particular, its low frequency content. Pierpont uses the term "wind farm syndrome" to describe the effects, which include headaches, sleeplessness and anxiety. The Pierpont report is not peer reviewed and the hypothesis is based on the assumption that infrasound levels near wind farms are higher than infrasound levels in the general environment.

The American and Canadian Wind Energy Association's panel reviewed the Pierpont report and the "wind farm syndrome" and concluded:

> *"Wind turbine syndrome," not a recognised medical diagnosis, is essentially reflective of symptoms associated with noise annoyance and is an unnecessary and confusing addition to the vocabulary on noise. This syndrome is not a recognised diagnosis in the medical community. There are no unique symptoms or combinations of symptoms that would lead to a specific pattern of this hypothesized disorder. The collective symptoms in some people are more likely associated with annoyance to low sound levels (Colby et al, 2009).*

To this end, the panel's report provides information on "the complex factors culminating in annoyance", which includes the nocebo effect (Spiegel, 1997).

The nocebo effect is "an adverse outcome, a worsening of mental or physical health, based on fear or belief in adverse effects. This is the opposite of the well known placebo effect, where belief in positive effects on an intervention may produce positive results" (Colby et al, 2009).

With respect to the nocebo effect, the panel concludes:

> *..the large volume of media coverage devoted to alleged adverse health effects of wind turbines understandably creates an anticipatory fear in some that they will experience adverse effects from wind turbines. ….The resulting stress, fear, and hyper vigilance may exacerbate or even create problems which would not otherwise exist. In this way, anti-wind farm activists may be creating with their publicity some of the problems they describe (Colby et al, 2009).*

There is a large amount of publicly available material that deals with alleged adverse health effects of wind turbines regardless of the overwhelming research to the contrary. A recent and relevant example includes an article as part of a series in the Sydney Morning Herald (SMH, 2010) on wind farms which included a quote that linked Hitler's torture methods to noise from a wind farm without any further information regarding the conclusions of recent health related research in the article.

The NHMRC review provides consistent conclusions to the panel with respect to health:

> *It has been suggested that if people are worried about their health they may become anxious, causing stress related illnesses. These are genuine health effects arising from their worry, which arises from the wind turbine, even though the turbine may not objectively be a risk to health (Chapman, 2009)*

Based on the above, it is essential that all stakeholders have access to a source of consolidated information that summarises the topics of interest that are commonly raised and the research that is available on these topics. A broad summary of health effects has been provided above, and the specific topics of interest commonly linked to adverse health effects are addressed in detail below, which include infrasound and low frequency content of a wind farm, amplitude modulation and sleep disturbance effects.

Infrasound and low frequency noise

The hypotheses regarding a link between infrasound from wind farms and the presence of adverse health effects including dizziness, headaches and nausea made by Pierpont (Pierpont, 2009) are not based on measured levels of infrasound from operational wind farms.

Specific International studies that have measured the levels of infrasound in the vicinity of operational wind farms indicate the following:

- The levels of infrasound are significantly below recognised perception thresholds and are therefore not detectable to humans (Hayes McKenzie Partnership Ltd, 2006); and
- The levels of infrasound are of the same order as those measured in residential areas due to general urban activity (Howe, 2006).

Similar studies are currently being conducted in Australia in order to provide an objective assessment and confirmation of the European research.

Notwithstanding the results of the objective assessments, Colby et al, 2009, have critiqued the Pierpont hypotheses and conclude:

> *No foundation has been demonstrated for the new hypothesis that exposure to sub-threshold, low levels of infrasound will lead to vibroacoustic disease. Indeed, human evolution has occurred in the presence of natural infrasound.*

Infrasound is a specific component of low frequency noise that requires a specific measurement methodology to identify it as it is readily affected by wind on the microphone. Wind is a source of natural infrasound.

Whilst the hypotheses regarding adverse health effects often refer to "low frequency noise", this is often a generic description which is taken to include infrasound.

The low frequency content of noise from a wind farm is easily measured and can also be heard and compared against other noise sources in the environment. Low frequency sound produced by wind farms is not unique in overall level or content and it can be easily measured and heard at a range of locations well in excess of that in the vicinity of a wind farm.

Colby et al (2009) notes with respect to low frequency noise:

> *The low frequency sound emitted by spinning wind turbines could possibly be annoying to some when winds are unusually turbulent, but there is no evidence that this level of sound could be harmful to health. If so, city dwelling would be impossible due to the similar levels of ambient sound levels normally present in urban environments.*

Amplitude Modulation

Amplitude modulation is an inherent noise character associated with wind farms. It should be noted that the ambient environment modulates in noise level by a significantly greater margin and over a significantly greater time period than that which would be audible from a wind farm at a typical separation distance. Notwithstanding, the South Australian Guidelines (2003 & 2009) note that the objective standards include a 5 dB(A) penalty for this fundamental and inherent character of amplitude modulation.

A 5 dB(A) penalty is a significant acoustic impost. To reduce a noise source by 5 dB(A) requires either the distance between the source and the receiver to be approximately doubled, or the noise source to reduce its output by two thirds. In wind farm terms, this means the distance between the farm and the nearest dwellings might need to be doubled, or up to two thirds of the total turbine numbers would need to be removed, compared to a wind farm not subject to such a penalty.

The ability to hear the "swish" (amplitude modulation) depends on a range of factors. It will be most prevalent when there is a stable environment (temperature inversion) at the wind farm and the background noise level at the listening location is low. In addition, amplitude modulation is greater when located cross wind from a wind turbine (Olermans and Schepers, 2009). It is noted that whilst the amplitude modulation is greater at a cross wind location, the actual noise level from the wind farm will be lower than at a corresponding downwind location. These conditions are most likely to occur when wind speeds at the wind farm are low under a clear night sky.

The swish is at its greatest under the above conditions as the change in wind speed at increased heights above the ground is also at its greatest, and this results in an increased difference in wind speed as the blades move through the top of their arc and down past the tower. In addition, if there are several turbines subject to similar conditions, then it is possible this can have an amplifying effect on the modulation. The increase in swish under these specific conditions is termed the Van Den Berg Effect, and it is suggested higher levels of swish might result in higher levels of annoyance and potentially sleep disturbance.

The Van Den Berg effect was observed on a flat site in Europe under specific conditions and in the two matters before the NSW Land and Environment Court (Gullen Range wind farm NSW LEC 41288 of 2008 and Taralga wind farm NSW LEC 11216 of 2007), it has been determined by the relevant experts that the required meteorological conditions to trigger the effect were not a feature of the environment. In Gullen Range (NSW LEC 41288 of 2008), the meteorological analysis prepared by Dr Chris Purton concluded that suitable conditions for this effect are not a feature of the area because of the elevated ridgeline location of the wind farm (Purton, evidence NSW LEC 41288 of 2008).

If suitable conditions did exist to regularly generate high levels of swish, then there is no scientific research to indicate that the existing Standards and Guidelines do not adequately account for it. Indeed, given the conditions are more likely to occur at night, then sleep disturbance would be the main issue to address, and the noise standards applied to wind farms are significantly more stringent than limits established for the potential onset of sleep disturbance. This is discussed in further detail in the following section.

In the first draft of the National Wind Farm Development Guidelines (EPHC, 2009), excessive swish is referred to as one of the potential Special Audible Characteristics (or SACs) along with low frequency, infrasound and tonality. It recommends that:

> *With the exception of tonality, the assessment of SACs will not be carried out during the noise impact assessment phase, that is, pre-construction. This arrangement reflects two key issues:*
>
> *i. There are, at present, very few published and scientifically-validated cases of any SACs of wind farm noise emission being problematic at receivers. The extent of reliable published material does not, at this stage, warrant inclusion of SACs other than tonality into the noise impact assessment planning stage.*
>
> *ii. In the case that reliable evidence did demonstrate merit in assessing such factors during the pre-construction phase, there is a gap in currently available techniques for assessing SACs as part of the noise impact assessment. In part this is due to the causes of most SACs in wind turbine noise emission not yet being clearly understood.*

In summary:

- Swish is an inherent noise characteristic of a wind farm;
- Modulation in noise level is a feature of the ambient noise environment surrounding a wind farm;
- The level and depth of swish can vary with meteorological conditions, and under certain conditions, will be more prevalent;
- The conditions to consistently generate high levels of audible swish have not been established to be a typical feature of Australian wind farms;
- The level, depth, time and testing regime for excessive swish that would justify introducing a more stringent standard have not been established;
- Sleep disturbance is the key issue associated with excessive swish, if it is to occur.

Sleep Disturbance

The World Health Organisation (WHO) establish a recommendation of 30 dB(A) inside a bedroom to prevent the potential onset of sleep disturbance effects (WHO, 1995).

The WHO guidelines indicate a noise level of 30 dB(A) inside a typical bedroom correlates to an external noise level with the windows open of the order of 45 dB(A). The typical baseline limit criterion of 35 dB(A) to 40 dB(A) found in Australian wind farm Standards and Guidelines is therefore significantly more stringent than the WHO guidelines recommendation of 45 dB(A), by a margin of at least 5 dB(A) and up to 10 dB(A).

For comparison purposes, a wind farm that complies with a 40 dB(A) baseline limit could introduce twice as many turbines again onto the site, or move of the order of half as close to the nearest dwelling, and still achieve the WHO recommendations to prevent the potential onset of sleep disturbance.

It should also be noted that the WHO recommendations are considered conservative in that they consider all available research and then use the most stringent approach to indicate the "potential onset" of sleep disturbance effects, which is not defined as full awakening, but rather as a change in the stage of sleep.

The UK Department of Trade and Industry (ETSU, 1997) recognise the above effect and recommend increasing the allowable noise level for wind farms during the night period, based on sleep disturbance effects. The baseline limit for wind farms during the night time in the UK is therefore 45 dB(A).

Based on the above, the baseline limits of Standards and Guidelines in Australia are sufficiently stringent to ensure the potential onset of sleep disturbance effects from the operation of a compliant wind farm does not occur.

REFERENCE LIST

Bass, J. H., Bullmore, A. J., Sloth, E. (1998). Development of a wind farm noise propagation prediction model. Contract JOR3-CT95-0051 May 1998.
The European Commission Joule III

Betke, K., Schults von Glahn, M., Goos, O.: Messung der Infraschallabstrahlung von windkraftanlagen" Proc DEWEK 1996, p 207-210 (In German)

Bowdler, D., Bullmore, A., Davis, B., Hayes, M., Jiggins, M., Leventhall, G., McKenzie, A., (2009). Prediction and assessment of wind turbine noise. Acoustics Bulletin pp35-37 Vol 34 No 2 March/April 2009

Brooks, Thomas F., D. Stuart Pope, and Michael A. Marcolini. 1989. Airfoil self-noise and prediction. L-16528; NAS 1.61:1218; NASA-RP-1218.
http://ntrs.nasa.gov/archive/nasa/casi.ntrs.nasa.gov/19890016302_1989016302.pdf

Colby, W. D., Dobie, R, Leventhall, G., Lipscomb, D., McCunney, R., Seilo, M. and Sondergaard, B., (2009). Wind Turbine Sound and Health Effects An Expert Panel Review. American Wind Energy Association, Canadian Wind Energy Association.

Council of Standards Australia, 2010, "AS 4959-2010 Acoustics – Measurement, prediction and assessment of noise from wind turbine generators", Standards Australia, Sydney.

Environment Protection Heritage Council (EPHC), 2009 and 2010, "National Wind Farm Development Guidelines – Public Consultation Draft", Adelaide.

Hayes McKenzie Partnership., 2006. "The Measurement of Low Frequency Noise at Three UK Wind Farms", UK Department of Trade and Industry (DTI)

Howe, B., November 2006. "Wind Turbines and Infrasound". Howe Gastmeier Chapnik Limited.

Hubbard, H. H., Shepherd, K. P., 1990, "Wind Turbine Acoustics", NASA

IEC 61400-11:2002 "Wind turbine generator systems – Part 11: Acoustic noise measurement techniques" IEC 2002

ISO 7196:1995 "Acoustics – Frequency weighting characteristics for infrasound measurements"

Jakobsen, J., (2005). "Infrasound Emission from Wind Turbines", Journal of Low Frequency Noise, Vibration and Active Control, Vol. 24, No. 3, Copenhagen

Leventhall, G., 2003 "A review of Published Research on Low Frequency Noise and its Effects" Department for Environment, Food and Rural Affairs (DEFRA)

Moeller, H, and C. S. Pedersen. "Hearing at Low and Infrasonic Frequencies", Noise and Health 2004, v6 issue 23, 37-57, 2004

Moorhouse, A., M. Hayes, S. von Hunerbein, B. Piper, and M. Adams. 2007. "Research into Aerodynamic Modulation of Wind Turbine Noise". Report: Department of Business, Enterprise and Regulatory Reform. www.berr.gov.uk/files/file40570.pdf

Oerlemans, S. and G. Schepers. 2009. Prediction of wind turbine noise directivity and swish. Proceedings of the 3rd International Conference on Wind Turbine Noise. Aalborg, Denmark. June 17-19, 2009. INCE/Europe.

O'Neal, R., Hellweg, R. D. Jr, Lampeter, R. M., 2009, "A Study of Low Frequency Noise and Infrasound from Wind Turbines", Epsilon Associates Inc, Maynard.

Pedersen, E and Waye, K. P., (2005). "Human response to wind turbine noise – annoyance and moderating factors", in Proceedings of the First International Meeting on Wind Turbine Noise: Perspectives for Control, Department of Environmental Medicine, Goteborg University.

Pierpont, N., March 2009. "Wind Turbine Syndrome – A report on a natural experiment". Pre-publication draft.

Queensland EPA, "Guideline: Assessment of Low Frequency Noise"

Rogers, A. L., Manwell, J., Wright, S., (2006). "Wind Turbine Acoustic Noise", Renewable Energy Research Laboratory, Department of Mechanical and Industrial Engineering, University of Massachusetts

Sloth, E., 2010, "Workshop 3: Wind Noise Management" (verbal presentation), Clean Energy Council National Conference, Adelaide, 2010

South Australian Environment Protection Authority, 2003, "Wind farms environmental noise guidelines"

South Australian Environment Protection Authority, 2009, "Wind farms environmental noise guidelines"

Spiegel, H., 1997 "Nocebo: The Power of Suggestibility" Preventative Medicine, 26, 616-621 1997

Standards Council New Zealand, 1998, "NZS 6808:1998 Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators", Standards New Zealand, Wellington.

Standards Council New Zealand, 2010, "NZS 6808:2010 Acoustics – The Assessment and Measurement of Sound from Wind Turbine Generators", Standards New Zealand, Wellington.

Sydney Morning Herald, 2010 "Wind farm approval blows town apart" 5th April 2010

Wagner, S., Bareiss, R., Guidati, G., 1996 "Wind Turbine Noise", Springer Verlag.

Worksafe Victoria, 10 February 2010, "Berrybank Wind Energy Facility" correspondence.

DPTI:scapreps

From:	Dene Cuthbertson <dene.cuthbertson@clearmail.com.au>
Sent:	Wednesday, 27 June 2018 8:27 AM
To:	DPTI:scapreps
Subject:	Submission re Neoen application
Attachments:	DC submission cover.pdf; ATT00001.htm; DC submission (Neoen CB) - 26 June 18.pdf; ATT00002.htm

To the Secretary, State Commission Assessment Panel,

Please find my cover sheet and submission for a representation regarding Neoen Australia Pty Ltd's development application for Crystal Brook Energy Park - Development Number 354/V003/18.

Regards,

Dene Cuthbertson
696 Beetaloo Valley Road, Beetaloo Valley South Australia 5523 | phone 08 8636 3114

171

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: Dene Cuthbertson

My phone number: 8636 3114

PRIMARY METHOD(s) OF CONTACT: Email address: dene.cuthbertson@clearmail.com.au

Postal address: 696 Beetaloo Valley Road, Beetaloo Valley

Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [x] owner of local property
- [x] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is As above Postcode.....

The specific aspects of the application to which I make comment on are: See attached document

.....

.....

.....

.....

.....

I
- [ ] wish to be heard in support of my submission
- [x] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 26 June 2018 Signature: D Cuthbertson

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

171

Dene Cuthbertson
696 Beetaloo Valley Road
BEETALOO VALLEY SA 5523
26 June 2018

To: The Secretary,
State Commission Assessment Panel,
GPO Box 1815,
ADELAIDE SA 5001

Regarding: The Neoen Australia Pty Ltd application for Crown Development (Development Number 354/V003/18) to build the Crystal Brook Energy Park - Hybrid renewable energy project.

I HEREBY STATE MY OBJECTIONS TO THE APPROVAL OF THE PROPOSED WIND FARM DEVELOPMENT.

In my view the proposed development would bring about environmental harm and nuisance to the area of the development, its surrounds and the people who live nearby for the following reasons.

1. Its impact on the visual amenity of the Southern Flinders Ranges
2. Its impact on the residents of the Crystal Brook township and Beetaloo Valley communities as the proposed wind towers are taller and closer to dwellings than any other wind farm thus far developed in Australia
3. Its impact on the residents of the Crystal Brook township and Beetaloo Valley communities due to an affect on property valuations
4. Its impact on the biodiversity of the Southern Flinders Ranges

1. Its impact on the visual amenity of the Southern Flinders Ranges

The Flinders Ranges is recognised as one of South Australia's most important icons and attracts visitors from throughout Australia and the world. **The proposed wind farm would damage the visual integrity of a 'gateway' to the Flinders Ranges thereby reducing the amenity value of the area and the icon.** People using the Heysen Trail, which passes through the area, would also see a degraded environment caused by the wind farm.

The wind farm would dominate the landscape. Approval for its development would set a dangerous precedent for future development along the ranges. Significant economic losses associated to tourism may be experienced with such a 'blight on the landscape', which is contrary to what is stated in the Neoen application.

2. Its impact on the residents of the Crystal Brook township and Beetaloo Valley community. The proposed wind towers are taller and closer to dwellings than any other wind farm thus far developed in Australia. The Environmental Protection Agency (EPA) guidelines may be inadequate to assess whether proper duty of care can be applied in the approval process

In a country with so much space and so few people it is incongruous that a wind farm be developed in such close proximity to a township and a rural community, especially since **there is significant local opposition to the development**, contrary to what is stated in the Neoen application. Residents of Crystal Brook and Beetaloo Valley have had meetings with Neoen representatives, made presentations to local government, presented a petition to State government (with 800 signatories) and had coverage in the media to express concerns about the wind farm component of the development – especially regarding visual impact and noise. The proposed towers are 240 metres tall, much larger than when the EPA guidelines were written. For this reason alone there needs to be a revision of EPA guidelines for the siting of wind farms in relationship to dwellings.

A further and even more compelling reason for a revision of the guidelines is provided by the growing body of evidence which shows that, although planners may have followed recommended preparation procedures and used the analytical methods advocated, the performance of many past projects has still fallen short of expectations with respect of human health and well being and the environment.

Renewed efforts to improve the quality of wind farm projects by the formulation of new development guidelines are, therefore, essential. Until that has happened this project should not be approved.

3. Its impact on the residents of the Crystal Brook township and Beetaloo Valley community due to an affect on property valuations

One of the predominant concerns of residents living close to the proposed development stems from the belief that the proximity of their properties to large-scale wind farms will lead to a decrease in property values (would they want to sell). In general terms, farm property prices might not be affected but for 'rural living' or 'lifestyle' properties, this is unlikely to be the case. The Beetaloo Valley area has around forty properties that fit into this 'rural living' or 'lifestyle' category.

The owners of these properties have sought and developed their land for many reasons: their love of the scenic beauty; the plants and native wild life; and, the peace and quiet, etc. These attributes would be destroyed by a wind farm development as envisaged.

Property losses in the order of tens of millions of dollars could accrue if the wind farm is developed – properties may become unsalable. This is based on local knowledge (from people living in the vicinity of the many wind farms in the region) and is contrary to what Neoen states in their application.

4. Its impact on the biodiversity of the Southern Flinders Ranges

The area straddling the proposed wind farm development site is rich in biodiversity. It is comprised of varied ecosystems, i.e., a) riparian (with river red gums), b) grassy woodland/woodland, c) shrubland/chenopod shrubland, and d) grassland ecosystems. These ecosystems are situated at the southern end of the Flinders Ranges and are important remnant fragments of pre-European settlement times. They provide a *refugium* for a diverse range of rare and endangered organisms.

Also, and critically they constitute a corridor through the Crystal Brook riparian zone to the Beetaloo Valley and onwards through the Flinders Ranges through which birds and animals travel. **The impact of a wind farm development cannot be fully predicted with certainty, but the likely effect would be catastrophic for the ecosystems affected.**

EBS ecology prepared the Flora and Fauna Assessment for the Neoen proposal. The assessment was limited by scant data (records sourced from the Biological Database of South Australia) and extremely limited fieldwork. Nonetheless their findings allude to an area rich in biodiversity. Their findings taken together with a large body of local knowledge indicate an area rich in biodiversity, which is home to threatened, rare and vulnerable plant communities, plants and animal species. **A wind farm would significantly and irreparably damage the ecosystems in the development zone.**

There is a legal requirement by the Australian Government to take into account EPBC (Environmental Protection and Biodiversity Conservation Act 1999) listed plant communities, plants and animals together with migratory birds when making decisions related to such a wind farm development.

Therefore a much more comprehensive survey and assessment of the area needs to be undertaken.

Recommendations

1. That the assessment panel - do not approve the wind farm development proposal in its present form.
2. That the assessment panel - require a more comprehensive biodiversity survey be conducted so that the consequences of the development can be better evaluated.
3. That the assessment panel advise the Government – that the EPA wind farm development guidelines be revised to take into account the larger wind farm towers being proposed and their siting relationships to townships and rural dwellings.
4. That the assessment panel advise the Government – that developments such as is proposed are likely to have economic consequences in the form of significant losses from reduced tourism earnings and devaluation of rural property values.

I reiterate my objections to the Neoen development proposal.

Sincerely,

D Cuthbertson

Dene Cuthbertson

DPTI:scapreps

From: taylah cave <taylahcave5@gmail.com>
Sent: Wednesday, 27 June 2018 7:48 AM
To: DPTI:scapreps
Attachments: Screenshot_20180627-074659.jpg

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	Friday 29 June 2018
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: Taylah Cave

My phone number: 0407170214

PRIMARY METHOD(s) OF CONTACT: Email address: Taylah.cave5@gmail.com

Postal address: PO BOX 393 CRYSTAL BROOK SA. Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [x] owner of local property
- [x] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 74 Talbots RD Postcode 5523

The specific aspects of the application to which I make comment on are: Way too close to my house!! Will devalue our home, the noise & safety if they caught alight! The height but no extra clearance worries me majorly. It's unfair for us who will live closely, we suffer, why others get rich from it!!!

I
- [ ] wish to be heard in support of my submission
- [x] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 26/6/2018 Signature: [signature]

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DPTI:scapreps

From: Sue Scott <steve.sue5@outlook.com>
Sent: Wednesday, 27 June 2018 7:30 AM
To: DPTI:scapreps
Subject: Submission - re Crystal Brook wind turbines
Attachments: CB wind turbines.pdf

Hi

Please find attached our submission re the Crystal Brook Energy Farm

Thanks

Stephen & Sue Scott

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DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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My name: Stephen + Sue Scott

My phone number: 0419 866445

PRIMARY METHOD(s) OF CONTACT: Email address: steve.sue5@outlook.com

Postal address: _____

_____ Postcode _____

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is Eyre Rd, CRYSTAL BROOK Postcode 5523

The specific aspects of the application to which I make comment on are:

the very close proximity of the wind turbines to Crystal Brook

the visual impact of the wind turbines

the effect the wind turbines will have on our wireless broadband & TV reception

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : _____

(Cross out whichever does not apply)

Date: 26/6/18 Signature: Sue Scott

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

Lodge, David (DPTI)

From: Joe Koch <breezyhillag@outlook.com>
Sent: Tuesday, 26 June 2018 9:23 PM
To: scareps@sa.gov.au
Cc: DPTI:Minister Knoll; DEWNR:Minister Speirs; lstephens@pirie.sa.gov.au; azubrinich@pirie.sa.gov.au; nwilson@pirie.sa.gov.au; demministerVHP@sa.gov.au; admin@saplanningcommission.sa.gov.au; ddevlin@pirie.sa.gov.au; kjackson@pirie.sa.gov.au; jpaparella@pirie.sa.gov.au; frome@parliament.sa.gov.au; mayor@pirie.sa.gov.au; djohnson@pirie.sa.gov.au; dgadaleta@pirie.sa.gov.au; mhopgood@pirie.sa.gov.au
Subject: Neoen Wind Turbines - Opposing position
Attachments: Neoen Wind Turbines - Opposing position.docx; NEOEN CONCERNS003.pdf

To Whom It May Concern,
Please find attached our opposing submission to the proposed wind turbines near Crystal Brook,
Regards
Robert and Joyleen Koch

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DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
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My name: Robert & Jayleen Koch.
My phone number: 0429672167
PRIMARY METHOD(s) OF CONTACT: Email address: breezyhillag@outlook.com
Postal address: PO Box 2N6 Georgetown
SA Postcode 5472.

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 359 HUMPHRIS RD WEST BUNDALEER Postcode 5472

The specific aspects of the application to which I make comment on are:

- Grain trucks impeded to Crystal Brook
- Heysen trail walkers deterant
- Noise affects
- Concerns on what it could lead to on our side of range

I
- [ ] wish to be heard in support of my submission
- [ ] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 26.6.18 Signature: J KOCH

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

To whom it may concern,

Our farming business writes to you with great concern of the proposed Crystal Brook Wind Turbine park on the Flinders Ranges. We do quite a bit of our farming business in Crystal Brook, and with the closest turbine at just 3.5km from the town, we believe this is far too close.

We are no strangers to the impact of wind turbines on the fracking of communities, their health impacts, their bush fire risks and their visual impact on the landscape. We know all these things as there are test towers near our home at West Bundaleer and we have done extensive research on the impact of the acoustics of turbines to nearby residents. We cannot even fathom how intrusive the noise will be from the proposed towers at Crystal Brook given they are a staggering 240m tall!!! As far as we are aware, no studies have been carried out, and no consideration has been given to the extra height on the towers.

As grain farmers who regularly use the Crystal Brook grain flow and Viterra sites for the delivery of grain, we are very concerned on the hold up on B-Double and Semi trucks through the gap north of Crystal Brook. If the windfarm goes ahead it would cause significant hold ups to our harvest operation – and as you can appreciate, at this time of the year, time is money!!!

We are currently developing a BnB at our farming residence at Georgetown as it sits along the Heysen trail and is popular for walkers. The Crystal Brook turbines would tower over the Heysen trail to the west of us which may detract walkers or take away from the natural geography.

We would like to reiterate that we are big advocates for boosting jobs, and development in the Mid North. We are also big believers in renewable energy, investing in solar on our farming properties. We would prefer to see our district be the leaders in other renewable types such as solar and hydrogen, that are less impactful on the vertical landscape

We trust you will consider our concerns when commenting on the proposal.

Regards

Robert and Joyleen Koch

Lodge, David (DPTI)

From: Julie Arbon <susan.arbon@bigpond.com>
Sent: Saturday, 23 June 2018 6:05 PM
To: admin@saplanningcommission.sa.gov.au
Subject: CB energy park
Attachments: IMG_1456.JPG; ATT00001.txt

Follow Up Flag: Follow up
Flag Status: Flagged

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	[illegible]
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line)
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: Julie Arbon

My phone number: [illegible]

PRIMARY METHOD(S) OF CONTACT: Email address: [illegible]

Postal address: 71 Railway Tce
Crystal Brook SA Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(S) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [✓] occupier of local property
- [✓] a representative of a company/other organisation affected by the proposal
- [✓] a private citizen

The address of the property affected is: 71 Railway Tce, C/Brook; 45 [illegible] St, C/Brook Postcode 5523

The specific aspects of the application to which I make comment on are:

- Concerned re noise aspect of the turbines and how it will affect CB residents (and effect on sleep & general health)
- This park is WAY too close to our township and the size of these turbines is MASSIVE! How detrimental to tourism in the Flinders Ranges.

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

By
- [ ] appearing personally
- [ ] being represented by the following person: ______

(Cross out whichever does not apply)

Date: 23 6 18 Signature: [signature]

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

- Concerns re interference with TV reception & internet.

plus other concerns

* PLEASE DONT LET THIS GO AHEAD *

Lodge, David (DPTI)

From: Darryl Matters <darryl.matters@bigpond.com>
Sent: Saturday, 23 June 2018 2:16 PM
To: admin@saplanningcommission.sa.gov.au
Subject: Crystal Brook Energy Park

Follow Up Flag: Follow up
Flag Status: Flagged

The Chairperson,
South Australian Planning Commission
Mr Tim Anderson

Dear Sir,
I write to you to express my objection to the above being given approval to proceed.

The visual amenity of the Mid North is already spoilt be the huge wind farms at Snowtown and Jamestown. As a long time resident of Crystal Brook, which has the town motto of "where the Flinders begin", I am concerned that the 260m high wind towers will adversely impact tourism in our area. Once word gets around that there are wind towers in the Flinders Ranges, tourism for the rest of the Flinders may also be affected.

Also of concern is the possible interference to TV reception in the town, with the towers in the direct line from out transmission tower on the Bluff and parts of Crystal Brook. The noise from these towers, that are taller than any others in the state, and the effect on property values in Crystal Brook are major concerns. It is also worth noting that the residents of Stirling North recently had a problem with glare from the solar farm located north of the township, a lot further away than the above proposed development.

I do not have a problem with renewables, having solar panels and battery back up on our house. However, I do have a problem with renewable projects that ruin both visual amenity and small town country living.

I respectfully request that you do not give approval for this project to proceed.

Yours sincerely

Darryl Matters
Proprietor
Road Technical Services
08 8636 2091
0498 605 875

Lodge, David (DPTI)

From: Jane Sargent <sargejane@westnet.com.au>
Sent: Saturday, 23 June 2018 8:50 AM
To: DEWNR:Minister Speirs; ministerVHP@sa.gov; admin@saplanningcommission.sa.gov.au; frome@parliment.sa.gov.au; mayor@pirie.sa.gov.au
Subject: Crystal Brook Energy Park
Attachments: NEOEN submission

Follow Up Flag: Follow up
Flag Status: Flagged

Enclosed is a copy of my submission sent to State Commission Assessment panel with my views

Jane Sargent

STATE COMMISSION ASSESSMENT PANEL
A COMMITTEE OF THE STATE PLANNING COMMISSION

APPLICATION ON NOTIFICATION – CROWN DEVELOPMENT

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).The energy storage facility (and substation, operations & maintenance building and storage facilities) would be located on a separate site (Lot 56 Collaby Hill Road), with the wind farm and solar farm sites connected to the battery site via an underground transmission line comprising 33kV cables. Crystal Brook Energy Park -
Type of development:	Crown development
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Start Date:	31 May 2018
Close Date:	**29 June 2018**

During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).

Written representations must be received by the close date (indicated above) and can either be posted, hand-delivered, faxed or emailed to the State Commission Assessment Panel (SCAP). A representation form is provided as part of this pdf document.

Any representations received after the close date will not be considered.

Postal Address:
The Secretary
State Commission Assessment Panel
GPO Box 1815
ADELAIDE SA 5001

Street Address:
Development Division
Department of Planning, Transport and Infrastructure
Level 5, 50 Flinders Street ADELAIDE

Email Address: scapreps@sa.gov.au
Fax Number: (08) 8303 0753

RECEIVED
27 JUN 2018
State Commission Assessment Panel

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	Friday 29 June 2018
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: NINA COUSINS

My phone number: 08 86 363 089

PRIMARY METHOD(s) OF CONTACT: Email address: NinaCousins@bigpond.com

Postal address: 78 EYRE RD

CRYSTAL BROOK S.A. Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is AS ABOVE Postcode 5523.

The specific aspects of the application to which I make comment on are:

THE AFFECTS ON BIO DIVERSITY / TOO HIGH / TOO CLOSE TO TOWNSHIP / VISUALLY UGLY / PROPERTY VALUES WILL BE AFFECTED NEGATIVELY / TV 3 WIRELESS BROADBAND WILL BE IMPACTED / VERY ~~LITTLE~~ FEW POSITIVE OUTCOMES FOR COMMUNITY / NOISE / SLEEP DEPREVATION

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 25/6/18 Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or
[illegible]@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: MURRAY + RUTH HEINJUS

My phone number: 86362110

PRIMARY METHOD(s) OF CONTACT: Email address: ~~—~~

Postal address: BOX 187

CRYSTAL BROOK Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [4] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [4] a private citizen

The address of the property affected is BOWAN CRT CRYSTAL BROOK Postcode 5523

The specific aspects of the application to which I make comment on are:

TOO CLOSE TO TOWNSHIP

I
- [ ] wish to be heard in support of my submission
- [V] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 24-6-18 Signature: Murray + Ruth Heinjus

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
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My name: MURRAY + RUTH HEINJUS

My phone number: 86362110

PRIMARY METHOD(s) OF CONTACT: Email address: ~~_____~~

Postal address: BOX 187

CRYSTAL BROOK Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [4] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [4] a private citizen

The address of the property affected is BOWAN CRT CRYSTAL BROOK Postcode 5523

The specific aspects of the application to which I make comment on are:

TOO CLOSE TO TOWNSHIP

I
- [ ] wish to be heard in support of my submission
- [V] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 24-6-18 Signature: Murray & Heinjus

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

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27 JUN 2018
State Commission Assessment Panel

DEVELOPMENT ACT, 1993, 549/549A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	Friday 29 June 2018
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: Michael B Cousins

My phone number: 08 86 363 089

PRIMARY METHOD(s) OF CONTACT: Email address: MickCousins@bigpond.com

Postal address: 78 Eyre Rd

Crystal Brook S.A Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is AS ABOVE Postcode 5523

The specific aspects of the application to which I make comment on are: Being at the start of the beautiful Flinders Ranges / UGLY / Visual pollution / Too close to the town / MINIMAL Jobs Created / TV Reception / WIRELESS BROAD BAND WILL BE AFFECTED. Property Values / Lack of Consultation

NOT IN THE FLINDERS RANGES

I
- [✓] wish to be heard in support of my submission
- [ ] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] ~~appearing personally~~
- [✓] being represented by the following person : Pam Pilkington

(Cross out whichever does not apply)

Date: 25/6/2018 Signature: M Cousins

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

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27 JUN 2018
State Commission Assessment Panel

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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My name: MAXINE KITSCHKE

My phone number: 0407615084

PRIMARY METHOD(s) OF CONTACT: Email address: jmKITSCHKKE@gmail.com.

Postal address: UNIT 5 BOWMAN COURT CRYSTAL BROOK. Postcode 5523.

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [✓] a private citizen

The address of the property affected is AS ABOVE Postcode 5523

The specific aspects of the application to which I make comment on are:

SPOILS TIP LANDSCAPE

PLUS POSSIBLE INTERFERENCE

WITH T.V.

I
- [✓] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : PAM PILKINGTON.

(Cross out whichever does not apply)

Date: 24.6.18 Signature: M. Kitschke

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

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27 JUN 2018
State Commission Assessment Panel

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-Ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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Phone Number:	7109 7066
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My name: MAURICE JOHN CURTIS & SANDRA KAYE CURTIS
My phone number: 86 362524
PRIMARY METHOD(s) OF CONTACT: Email address: _____
Postal address: UNIT 5 55 EYRE ROAD
CRYSTAL BROOK Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
[ ] owner of local property
[X] occupier of local property
[ ] a representative of a company/other organisation affected by the proposal
[X] a private citizen

The address of the property affected is ..... Postcode.....

The specific aspects of the application to which I make comment on are: CRYSTAL BROOK ENERGY PARK WE DO NOT NEED 26 HUGE TURBINES IN THE SOUTHERN FLINDERS RANGES; IT WILL MAKE NO DIFFERENCE TO OUR POWER BILLS AND WILL BE AN EYE SORE ON THE LANDSCAPE.

I
[X] wish to be heard in support of my submission
[ ] do not wish to be heard in support of my submission
(Please tick one)

by
[ ] appearing personally
[ ] being represented by the following person : .....
(Cross out whichever does not apply)

Date: 24.6.18 Signature: M Curtis — S Curtis

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or

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27 JUN 2018
State Commission Assessment Panel

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
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During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: John Hutchins

My phone number:

PRIMARY METHOD(s) OF CONTACT: Email address:

Postal address: 2 Youngbusband Tce
Crystal Brook Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is as above Postcode 5523

The specific aspects of the application to which I make comment on are: Nil to this effect the Telecommunication aspect of our Township. We are in direct line with this Project.

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person :

(Cross out whichever does not apply)

Date: 24/6/18 Signature: J Hutchins

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or
spanrep@sa.gov.au

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27 JUN 2018
State Commission Assessment Panel

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
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Phone Number:	7109 7066
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My name: Jennifer Hickey

My phone number: 0409362827.

PRIMARY METHOD(s) OF CONTACT: Email address: countryhic1@bigpond.com.

Postal address: 66 Mitchell Street

CRYSTAL BROOK Postcode 5523.

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 66 mitchell st. crystalbrook Postcode 5523.

The specific aspects of the application to which I make comment on are: wind farm

Too close to our town. Noise - my son wears hearing aids - will affect him

eye sore.

I
- [✓] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 24.6.18. Signature: Jennifer Hickey

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

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State Commission Assessment Panel

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	Friday 29 June 2018

During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).

My name: Doreen Cook

My phone number: 86362869

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 8, 12, Bowman St.
Crystal Brook Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [X] owner of local property
- [X] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 12 Bowman St Postcode 5523

The specific aspects of the application to which I make comment on are:

concerns about the closness to our small town & degrading of property value.

I
- [ ] wish to be heard in support of my submission
- [X] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : _____

(Cross out whichever does not apply)

Date: 24/6/2018 Signature: Doreen R Cook

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

RECEIVED
27 JUN 2018
State Commission Assessment Panel

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
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Contact Officer:	Lee Webb
Phone Number:	7109 7066
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During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: DON & ALLISON TILBROOK

My phone number: 8636 2129

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: _____

_____ Postcode _____

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is .....Postcode.....

The specific aspects of the application to which I make comment on are: .....

No WIND FARMS NEAR CRYSTAL BROOK

I
- [ ] wish to be heard in support of my submission
- [ ] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: ..... Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

RECEIVED
27 JUN 2018
State Commission Assessment Panel

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
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My name: BARBARA "KEZIAH" SCHWARTZ

My phone number: 0886362417

PRIMARY METHOD(s) OF CONTACT: Email address: keziah@outlook.com

Postal address: 51 MITCHELL ST CRYSTAL BROOK

Postcode 5523

<u>You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.</u>

My interests are:
- [X] owner of local property
- [X] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [X] a private citizen

The address of the property affected is 51 MITCHELL ST CRYSTAL BROOK Postcode 5523

The specific aspects of the application to which I make comment on are: VALUATION CONCERNS FOR FUTURE SALE OF MY PROPERTY.

I
- [ ] wish to be heard in support of my submission
- [X] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 24.6.18 Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or

scapanel@sa.gov.au

DPTI:scapreps

From: Brooke Orrock <tjbe@bigpond.com>
Sent: Tuesday, 26 June 2018 8:47 PM
To: DPTI:scapreps; admin@saplanningcommission.sa.gov.au; frome@parliament.sa.gov.au; mayor@pirie.sa.gov.au; lstephens@pirie.sa.gov.au; azubrinich@pirie.sa.gov.au; nwilson@pirie.sa.gov.au; ddevlin@pirie.sa.gov.au; kjackson@pirie.sa.gov.au; jpaparella@pirie.sa.gov.au
Cc: DPTI:Minister Knoll; djohnson@pirie.sa.gov.au; dgadaleta@pirie.sa.gov.au; mhopgood@pirie.sa.gov.au
Subject: Crystal Brook Wind Tower Farm - Application
Attachments: Orrock Application.pdf; RE NA TAYLOR Application.pdf; Taylor Application.pdf

To Who It May Concern

Please find attached 3 applications regarding not having the Wind Towers at Crystal Brook, South Australia.

Kind regards
Brooke & Todd Orrock

Orrock Farming
20598 Horrocks Highway
Murray Town SA 5481
PH: 0428672337
E: tjbe@bigpond.com

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: Brooke Orrock

My phone number: 0428 672 337

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: PO Box 69

Murray Town Postcode 5481

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [x] a private citizen

(Family Farm)

The address of the property affected is Crystal Brook Valley Rd Postcode 5523

The specific aspects of the application to which I make comment on are:

- Towers are to high and are inappropiate for the Southern Flinders Ranger beauty.
- Reduces land values of the family Farm.
- Noise of them is ridiculous
- Risk of Fires – Firer Fighters can't get close enough

I
- [ ] wish to be heard in support of my submission
- [x] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : _____

(Cross out whichever does not apply)

Date: 21/6/18 Signature: BOrrock

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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My name: R.E & N.A. Taylor

My phone number: 86362199

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: Box 39

Crystal Brook Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:

- [M] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 32 Crystal Brook Valley Rd Postcode 5523

The specific aspects of the application to which I make comment on are:

- Direct line of noise coming through valley - Height of proposed towers is inappropriate! These towers will destroy beauty as turbines will be very prominent and destory the environment.
- Reduces property values

I

- [ ] wish to be heard in support of my submission
- [M] do not wish to be heard in support of my submission

(Please tick one)

by

- [ ] appearing personally
- [ ] being represented by the following person : _____

(Cross out whichever does not apply)

Date: 29/6/18 Signature: N. Taylor

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
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My name: REBECCA TAYLOR.

My phone number: 0428 362199

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 50 TAYLOR ROAD

CRYSTAL BROOK Postcode [redacted]5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [x] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is CRYSTAL BROOK VALLEY ROAD Postcode 5523.

The specific aspects of the application to which I make comment on are:

- TOWER: ARE HIDEOUS LOOKING AGAINST THE NATURAL BEAUTY OF THE FLINDERS RANGES - THEY WILL STICK OUT LIKE DOGS BALLS.
- DIRECT LINE OF NOISE COMING THROUGH - WHERE I WORK.
- STRESS TO THE FARM ANIMALS + HORSES
- REDUCES PROPERTY VALUES

I
- [ ] wish to be heard in support of my submission
- [ ] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 20/6/18 Signature: R M Taylor

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

* IT WILL MAKE 1 PERSON RICH WHILE OTHER (ALOT) OF FAMILY SUFFER!

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

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My name: PETER AHERN

My phone number: 0417 895 287

PRIMARY METHOD(s) OF CONTACT: Email address:

Postal address: 29 MERCOWIE RD

Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:

- [x] owner of local property
- [x] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 29 Mercowie RD Postcode 5523

The specific aspects of the application to which I make comment on are: loss of property Valuation, Visual impact of turbines on Flinders Ranges, inadequacy of EPA windfarm noise guidelines, Impact on television reception.

I

- [ ] wish to be heard in support of my submission
- [x] do not wish to be heard in support of my submission

(Please tick one)

by

- [ ] appearing personally
- [ ] being represented by the following person:

(Cross out whichever does not apply)

Date: 23/6/18 Signature:

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or
scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
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My name: Molly Hood

My phone number: 0457 892 905

PRIMARY METHOD(s) OF CONTACT: Email address:

Postal address: 73 Combe Road

Laura Postcode 5480

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [x] owner of local property
- [x] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [x] a private citizen

The address of the property affected is 73140 Horrocks HWY LAURA 5480 / ~~10 Bonman St Crystal Brook~~ Postcode ~~5523~~

The specific aspects of the application to which I make comment on are:

Impact on visual amenity of Flinders Ranges, decommissioning of turbines, environmental impacts to local land, devaluation of property

I
- [x] wish to be heard in support of my submission
- [ ] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person: Genevieve Wells, Pam Pilkington

(Cross out whichever does not apply)

Date: 22/6/18 Signature: [signature]

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
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Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	Friday 29 June 2018
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My name: Kerry Head

My phone number: 0400 276550

PRIMARY METHOD(s) OF CONTACT: Email address: KTSMhead@bigpond.com

Postal address: 10 Bowman Street Crystal Brook Sth Aust. Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- ☑ owner of local property
- ☑ occupier of local property
- ☐ a representative of a company/other organisation affected by the proposal
- ☑ a private citizen

The address of the property affected is 28 John & 10 Bowman Streets Postcode 5523

The specific aspects of the application to which I make comment on are: While I have no issue with the concept of the Solar Park, I do not endorse the proposed Windfarm Turbines. Growing up on the land South of Hughes Gap, my father spent his life planting trees and preserving the natural bush, flora & fauna where this very proposal is planned. Turbines towering over my residence, farm block and visual from all areas of my beautiful town. NO thanks.

I
- ☑ wish to be heard in support of my submission
- ☒ do not wish to be heard in support of my submission

(Please tick one)

by
- ☑ appearing personally
- ☑ being represented by the following person: Gen Wells Pam Pilkinton

(Cross out whichever does not apply)

Date: 16/06/2018 Signature: K Head

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

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My name: JOANNE BEDDON

My phone number: 0402 787 761

PRIMARY METHOD(s) OF CONTACT: Email address:

Postal address: 29 MERCOWIE RD
CRYSTAL BROOK. Postcode 5523.

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [Y] owner of local property
- [Y] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 29 Mercowie RD Postcode 5523

The specific aspects of the application to which I make comment on are: Loss of property valuation, proximity to Crystal Brook township, impact on visual amenity of Flinders Ranges, decommissioning of turbines.

I
- [ ] wish to be heard in support of my submission
- [Y] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person: .....

(Cross out whichever does not apply)

Date: 23/6/18 Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

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Contact Officer:	Lee Webb
Phone Number:	7109 7066
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My name: Jean McLeod

My phone number: 86362206

PRIMARY METHOD(s) OF CONTACT: Email address: ——

Postal address: 8 Allan Street

Crystal Brook Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:

- [x] owner of local property
- [x] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 8 Allan Street Postcode 5523

The specific aspects of the application to which I make comment on are: Impact on visual amenity of the Flinders Ranges, destruction of local environment and land, disruption of television reception.

I

- [ ] wish to be heard in support of my submission
- [x] do not wish to be heard in support of my submission

(Please tick one)

by

- [ ] appearing personally
- [ ] being represented by the following person:

(Cross out whichever does not apply)

Date: 25/6/18 Signature: J McLeod

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scaperp@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
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My name: Hannah Gum

My phone number: 0455 003 562

PRIMARY METHOD(s) OF CONTACT: Email address:

Postal address: PO Box 74

Crystal Brook Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 28 Eyre Road Postcode 5523

The specific aspects of the application to which I make comment on are: EPA noise guidelines inadequacies, visual impact on the Flinders Ranges and township of Crystal Brook, proximity to Crystal Brook township, decommissioning.

I
- [ ] wish to be heard in support of my submission
- [x] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person:

(Cross out whichever does not apply)

Date: 25/6/18 Signature: Hgum

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

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My name: HANNAH ARBON

My phone number: 86356

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: 29 MERCOWIE RD

CRYSTAL BROOK Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 29 Mercowie RD Postcode 5523.

The specific aspects of the application to which I make comment on are: proximity to residences and Crystal Brook township, impact on visual amenity of the Flinders Ranges

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person: _____

(Cross out whichever does not apply)

Date: 23/6/18 Signature: HArbon

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or
scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

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My name: Charlie Head

My phone number: 0437 468828

PRIMARY METHOD(s) OF CONTACT: Email address: ktsmhood@bigpond.com

Postal address: 10 Bowman Street

Crystal Brook Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [✓] a private citizen

The address of the property affected is 28 John Street Postcode 5523.

The specific aspects of the application to which I make comment on are: not against Wind towers but these are way too close to the township. Visual looks of the Flinders & the impact it will have on our tv & internet service

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person: _____

(Cross out whichever does not apply)

Date: 25/6/18 Signature: C Head

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

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My name: Beki Vaughn

My phone number: 0438 607 717

PRIMARY METHOD(s) OF CONTACT: Email address:

Postal address: 162 Degilbo Mines RD

Degilbo Postcode 5621

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [M] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [M] a private citizen

The address of the property affected is 28 John Street Crystal Brook Postcode 5523

The specific aspects of the application to which I make comment on are: Decommissioning of wind turbines at end of contract, loss of property valuation, destruction and disruption of local flora & fauna, loss of tourism due to visual impact on the Flinders Ranges.

I
- [ ] wish to be heard in support of my submission
- [M] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person: .....

(Cross out whichever does not apply)

Date: 25/6/18 Signature: BVW

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	Friday 29 June 2018
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: Adam Combe

My phone number: 0429 643 320

PRIMARY METHOD(s) OF CONTACT: Email address:

Postal address: 73 Combe Road

Laura Postcode 5480

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [✓] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [✓] a private citizen

The address of the property affected is 17140 Horrocks Hwy Laura Postcode 5480

The specific aspects of the application to which I make comment on are: devaluation of property, visual impact & tourism of Flinders Ranges, decomissioning of towers at end of contract

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person: .....

(Cross out whichever does not apply)

Date: 22/6/18 Signature: AC

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DPTI:scapreps

From: Tim Zwar <timothyzwar@gmail.com>
Sent: Tuesday, 26 June 2018 5:49 PM
To: DPTI:scapreps
Cc: DEM:Minister Dan van Holst Pellekaan; frome@parliament.sa.gov.au; mayor@pirie.sa.gov.au
Subject: energy park at Crystal Brook
Attachments: Cr Bk energy park submission DB.pdf; Cr Bk energy park submission TZ.pdf

Please find attached 2 x concerns raised in regards the proposed development.

Thanks, Tim Zwar

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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My name: Dianne Becker

My phone number: 0439 893 162

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: PO Box 62

WIRRABARA SA Postcode 5481

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [x] a private citizen

The address of the property affected is .....Postcode.....

The specific aspects of the application to which I make comment on are: .....

The Flinders Ranges (including the Southern Flinders Ranges commencing near Crystal Brook) must be .....

protected from these kinds of developments .....

The natural beauty of the area must not be ruined & needs to be maintained for locals & visitors alike now and .....

into the future .....

.....

I
- [ ] wish to be heard in support of my submission
- [x] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 22/6/2018 Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

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Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
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Contact Officer:	Lee Webb
Phone Number:	7109 7066
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My name: Tim Zwar

My phone number: 0428 684 066

PRIMARY METHOD(s) OF CONTACT: Email address: _____

Postal address: BOX 62

WIRRABARA SA Postcode 5481

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [ ] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [M] a private citizen

The address of the property affected is ..... Postcode.....

The specific aspects of the application to which I make comment on are: I think that the planned locations for the wind turbines are too close to the township of Crystal Brook and the Beetaloo Valley. I do not want to see turbines on the Flinders Ranges

.....

.....

I
- [ ] wish to be heard in support of my submission
- [M] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 25/6/18 Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DPTI:scapreps

From: Kleinig, Meredith (Gladstone High School) <Meredith.Kleinig361@schools.sa.edu.au>
Sent: Tuesday, 26 June 2018 2:35 PM
To: DPTI:scapreps
Subject: Crystal Brook Energy Park
Attachments: neoen Spanner152.jpg

Please find attached
Graeme Combe

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
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Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
During the notification period, hard copies of the application documentation can be viewed at the Department of Planning, Transport and Infrastructure, Level 5, 50 Flinders Street, Adelaide during normal business hours. Application documentation may also be viewed during normal business hours at the local Council office (if identified on the public notice).	

My name: GRAEME COMBE

My phone number: 0408 895 097

PRIMARY METHOD(s) OF CONTACT: Email address: spannercombe@gmail.com

Postal address: 1109 GLADSTONE - BEETALOO ROAD BEETALOO VALLEY Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is POSTAL ADDRESS ABOVE Postcode 5523

The specific aspects of the application to which I make comment on are: CONCERNS REGARDING THE WIND TURBINES & THE VISUAL HARM TO ANY AREA DESPERATELY TRYING TO PROMOTE TOURISM OF THE "GATEWAY TO THE FLINDERS RANGES"! NOISE AND HEALTH EFFECTS ALSO - AND THE FACT THE TURBINES ARE 240 METRES TALL — TALLER THAN ALL BUT 3 OF ADELAIDE'S CBD SKYSCRAPERS - NO GC

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 25-6-18 Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DPTI:scapreps

From:	Kleinig, Meredith (Gladstone High School) <Meredith.Kleinig361 @schools.sa.edu.au>
Sent:	Tuesday, 26 June 2018 2:29 PM
To:	DPTI:scapreps
Subject:	Submission Meredith Kleinig Crystal Brook Energy Park
Attachments:	neoenMeredith153.jpg

DEVELOPMENT ACT, 1993, S49/S49A – CROWN DEVELOPMENT
REPRESENTATION ON APPLICATION

Applicant:	Neoen Australia Pty Ltd
Development Number:	354/V003/18
Nature of Development:	Crystal Brook Energy Park - Hybrid renewable energy project comprising a wind farm (26 turbines with a capacity up to 125MW), a solar farm (400,000-500,000 solar panels with a capacity up to 150MW), an energy storage facility (Lithium-ion battery with a capacity up to 130MW / 400MWh) and associated infrastructure for connection to the electricity grid (including a 33kV/275kV substation and a 300m long 275kV transmission line between the substation and the 275kV Para-Bungama transmission line).
Zone / Policy Area:	Primary Industry Zone - Port Pirie Regional Council
Subject Land:	32 allotments, approximately 3.5km north of Crystal Brook and 23km south-east of Port Pirie.
Contact Officer:	Lee Webb
Phone Number:	7109 7066
Close Date:	**Friday 29 June 2018**
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My name: MEREDITH ANNE KLEINIG

My phone number: 0429426382

PRIMARY METHOD(s) OF CONTACT: Email address: meredithkleinig@activ8.net.au

Postal address: 560 Beetaloo Valley Rd

Beetaloo Valley Postcode 5523

You may be contacted via your nominated PRIMARY METHOD(s) OF CONTACT if you indicate below that you wish to be heard in support of your submission.

My interests are:
- [✓] owner of local property
- [ ] occupier of local property
- [ ] a representative of a company/other organisation affected by the proposal
- [ ] a private citizen

The address of the property affected is 560 Beetaloo Valley Rd Postcode 5523

The specific aspects of the application to which I make comment on are: The visual impact of towers 240m tall on the ranges. The impact on migratory birds that use the Crystal Brook Creek system e.g. rainbow bee eaters. The destruction of local habitat that creates a corridor between Bowman Park and Beetaloo Reservoir. The effect on loss of habitat and disturbance to animals such as echidna. The fact that the applicant has not undertaken a survey in spring

I
- [ ] wish to be heard in support of my submission
- [✓] do not wish to be heard in support of my submission

(Please tick one)

by
- [ ] appearing personally
- [ ] being represented by the following person : .....

(Cross out whichever does not apply)

Date: 25/6/18 Signature: .....

Return Address: The Secretary, State Commission Assessment Panel, GPO Box 1815, Adelaide, SA 5001 or scapreps@sa.gov.au

DPTI:scapreps

From: Gweneth <gweneth@westnet.com.au>
Sent: Tuesday, 26 June 2018 12:42 PM
To: DPTI:scapreps
Subject: Dev. No: 354/V003/18

Attention: Lee Webb

I am writing this email in objection of the proposed 26 wind turbines to be erected as Crystal Brook Energy Farm.

Apart from the abomination that windfarms make of the landscape turning the beautiful, flowing, undulating Flinders ranges into hills with a dead stick look which is most unattractive to the eye, the health effects of stirring up the energy around our homes is of great concern to me. The Flinders Ranges is a place that many tourists visit yearly to see the natural beauty of this wonderful place. Every year that goes by, that natural beauty is being stolen by a ridiculously dangerous industry. Please think about our tourist industry which brings lots of dollars to our otherwise struggling businesses. And then think of the cost to our health!

I am a professional kinesiologist who spends time assisting people overcome life issues which includes sensitivities to foods and environmental sensitivities.

I am also extremely energy sensitive myself.

You only have to take a look at nature to see the absolute effects that wind has on animals. When there are prevailing winds, all dogs take shelter wherever possible or they become distressed.
Sheep and cows find shelter wherever possible or lay in long grass to avoid the effects of the wind. Animals do not like to be disturbed by wind! Why? Because it upsets their equilibrium!
However they can choose the direction in which to face in a natural wind to ensure the least amount of disruption to their equilibrium.

Do you not think that it has the same effects on humans? Try being in child care on a very windy day. It is testing to say the least!

I know without doubt, having personally experienced it myself, that the turbulence from the wind turbines has a huge effect on the energy field of a person, effecting the mood, disrupting sleep patterns, producing headaches etc.
I did not know much about windfarms prior to coming to S.A. and went on a holiday at Edithburg and stayed at a cabin park not far from the large windfarm there. This park is overlooking the sea which usually puts me right at peace and allows me to fully relax. I am generally a relaxed person not terribly fussed by much at all. The experience I had at Edithburg was very different! Firstly I experienced headaches. Then I could not sleep at night. I also experienced digestive issues, which is something I never have. I felt very unsettled and felt I needed to leave the camp every day and just wanted to "get away!" I was actually quite agitated at times. At first I just did not understand this experience until I decided one day to take a closer look at the windfarm and the closer I got to the actual site of the windfarm, the sicker I felt. Then I understood!
When I thought about it at length, I realized it was like putting yourself into an egg beater and expecting to feel good. Really? Why would that make sense?

I live in Gladstone now and although there are windfarms in many areas around us, there are none on our doorstep and I would really like to keep it that way!

When I travel through the areas that have windfarms on properties, I experience instant headaches and a queasiness in my stomach. It is not a good feeling and I would hate to have a windfarm right on my doorstep creating those feelings on a daily basis. I would definitely have to move which would defeat the whole reason for me choosing this place for my retirement. And that is just ME!
I would hate to think what would happen to our farming society who are already stressed having experienced bad seasons. Imagine being already stressed and having to deal with your whole body being in turbulence. It is a disaster just waiting to happen!

Not only do I fear for the health of our community, I also fear for the health of the animals that are forced to graze under these huge wind turbines! Their whole system is being churned up in the movement that these turbines create. It has to have some effect on the structure and DNA of the animal. And then we butcher and EAT that very meat which has been in disturbing circumstances. It will definitely alter the structure of the fibres and cells of that animal.