

# CRYSTAL BROOK

## ENERGY PARK

Development Application  
Response to Submissions



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## Chapter 1 – Public Submissions

### Distribution of submissions & response methodology

Many of the submissions received raised similar objections with slight variations in wording. For convenience, this Response groups similar objections together and responds to each one individually in order of the frequency with which they were raised.

Neoen received approximately 263 submissions on the project during the 4-week period of public consultation ('approximate' because some were submitted more than once by different methods and in different formats – Neoen has tried to account for these but cannot guarantee 100% accuracy and some double-counting may have occurred). Of these:

- 15 expressed support for the project;
- 9 expressed support for the solar and storage components, but not the wind component; and
- Approximately 240 expressed general opposition to the project on various grounds.

Of the approximately 249 submissions which raised objections, approximately **155** were submitted by persons sharing the same 48 surnames. Neoen considers it probable that most of these submissions were submitted by family members and relatives. Of these 48 families, many made 3, 4, 5 or 6 submissions per family, with one making 11 submissions.

The geographic distribution of submissions (to the best of Neoen's understanding) is set out in Table 1 below.

*Table 1—Geographic distribution of submissions*

<b>Local Area</b> Crystal Brook: 151 Beetaloo Valley: 24 Laura: 20 Huddleston: 1 Merriton: 1 Napperby: 1 Narriby: 4 Gladstone: 3 Port Pirie: 22 Armagh: 1 Warnertown: 1 Clements Gardens: 1	<b>South Australia</b> Port Augusta: 3 Eudunda: 1 Adelaide (incl. St Marys, Brompton, North Plympton, Somerton Park): 5 Booleroo: 5 Wirrabara/Werrabarra: 3 Georgetown: 1 Murray Town: 1 Whyalla: 1
<b>Total: 230 (of which 15 were in support)</b>	<b>Total: 20</b>
<b>Interstate</b> Mosman, NSW: 1 Soldiers Hill, VIC: 1 Bell Park, VIC: 1 Banyule, VIC: 2 Degilbo, QLD: 1	<b>Address unspecified</b> Address unknown: 4
<b>Total: 6</b>	<b>Total: 4</b>

## 1. Visual Impact

Approximately 41% of submissions raised the issue of visual impact, with a large majority of these focused on the wind turbines as opposed to the solar or storage components. The main concerns set out in these submissions are below, followed by Neoen's responses (drawing upon the Landscape and Visual Impact Assessment prepared by Neoen's expert consultant contained in the CBEP DA):

### a) Wind turbines are 'ugly' or contrary to the scenic character of the area

Neoen acknowledges and accepts that it is natural for residents to be attached to their local area. Notwithstanding, Neoen notes the specialist study performed for the CBEP Development Application, which pointed out strong differentiation between the classic Flinders Ranges landscapes and the modified agricultural landscape of the Crystal Brook Area.

Based on this study, Neoen does not accept that the CBEP project site is characterised by unusual or unique scenic amenity beyond that of many other wind farm sites in South Australia; nor does it accept that the project site, almost the entirety of which has been cropped or grazed for many generations, retains a significant amount of its natural character. Please note the following extract from the Landscape and Visual Impact Assessment, forming Chapter 2 of the CBEP DA:

*Whilst the broader regional Flinders Ranges landscape displays characteristics which are highly valued and have a high degree of visual amenity, the Project's immediate landscape character is represented by a partially modified agricultural landscape, comprising lower rounded and sparsely timbered, grassed and cropped hills. The Project Site landscape character is commonly found, and generally ubiquitous, within the broader landscape.<sup>1</sup>*

Relevantly, Neoen notes that Council zoning of the project site (Primary Production) recognises that its character is agricultural rather than scenic, by comparison with the Rural Landscape Protection (RLP) Zone located further to the north. Wind farms are specifically listed as an 'Objective' of Primary Production Zones: 'Wind farms and ancillary development located in the zone, accepting that this may need to be sited in visually prominent locations to take advantage of natural resources such as wind.'<sup>2</sup>

Neoen notes that this is further supported by:

1. The **South Australian Wind Farm Development Guidelines**, where the following is noted with regard to PDC 2: *Visual impact is not a factor in its own right to oppose a wind farm because of its cumulative scale and appearance, whether marginal or intrusive and extensive, on the landscape. Rather, this element is to be 'managed' through a set of criteria that is essentially of a technical nature than the framing of more subjective, 'visual amenity-aligned' policy considerations.*<sup>3</sup>
2. The **Statewide Wind Farm Development Plan Amendment** of 18 October 2012, which noted that '[Wind] facilities will need to be located in areas where they can take advantage of the natural resource upon which they rely and, as a consequence, components (particularly turbines) may need to be:
  - located in visually prominent locations such as ridgelines;

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<sup>1</sup> Executive Summary, LVIA p 7

<sup>2</sup> [https://www.dpti.sa.gov.au/\\_data/assets/pdf\\_file/0011/250004/Port\\_Pirie\\_Council\\_Development\\_Plan.pdf](https://www.dpti.sa.gov.au/_data/assets/pdf_file/0011/250004/Port_Pirie_Council_Development_Plan.pdf) p 147

<sup>3</sup> <https://www.lga.sa.gov.au/webdata/resources/files/2012.32%20-%20Windfarm%20Development%20Guidelines%20-%20Final%20Report.pdf> p 10

- visible from scenic routes and valuable scenic and environmental areas;  
and
- located closer to roads than envisaged by generic setback policy.

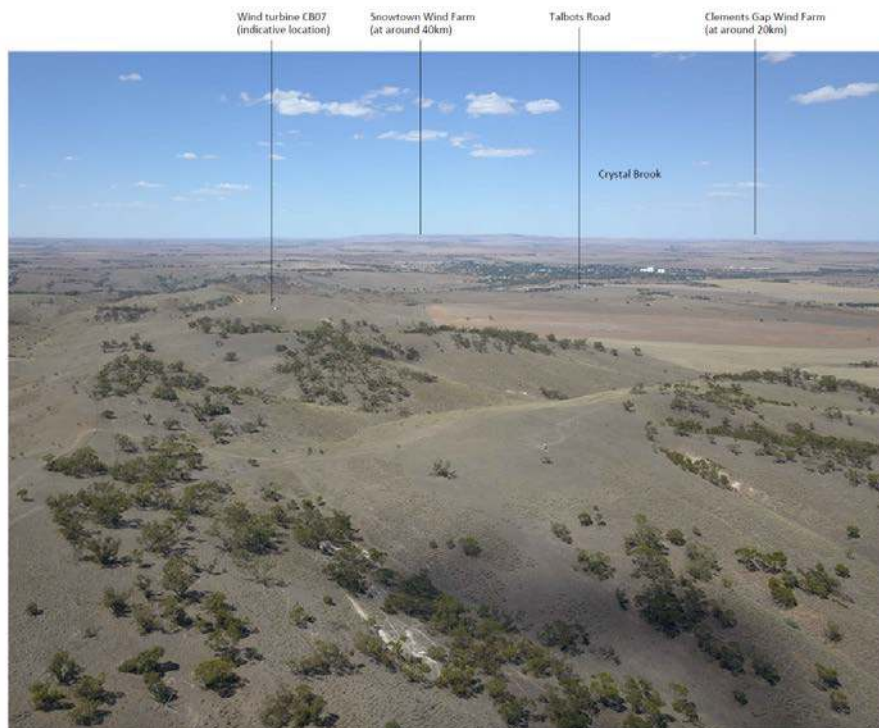
*This, coupled with the large scale of these facilities (in terms of both height and spread of components), renders it difficult to mitigate the visual impacts of wind farms to the degree expected of other types of development. Subject to implementation of management techniques set out by general / council wide policy regarding renewable energy facilities, **these visual impacts are to be accepted in pursuit of benefits derived from increased generation of renewable energy.***

Figure 1—Ground view of site



Photo location P12 - View east to south from Wilkins Highway

Figure 2—Aerial view of site toward Crystal Brook



Aerial photo viewpoint A3 - Aerial view south from project site above wind turbine CB28



b) Wind turbines are not appropriate in the Flinders Ranges

Previously, the CBEP layout comprised 54 turbines instead of the current 26, with the additional turbines extending approximately 5km north of the Wilkins Highway. Port Pirie Council subsequently advised Neoen that the land north of the Wilkins was a 'Rural Landscape Protection Zone' (RLP Zone), and that while the landscape was similar for several kilometres north of the Wilkins to that found in the current project area south of the Wilkins, it nevertheless preferred that no turbines be placed there, in order that it remain as a 'buffer' to protect the Flinders Ranges proper. Consequently, the project has been significantly amended such that all turbines are now located entirely within Primary Production-zoned land.

In acknowledgement of this rationale, Neoen removed all turbines north of the Wilkins Highway. Neoen agrees that the Flinders Ranges contain many areas of immense natural beauty and unique scenic Value, and these areas should be protected against inappropriate development. When speaking of the 'Flinders Ranges', however, the images evoked are rugged escarpments, outcrops and rock formations such as Wilpena Pound, Arkaroola and the Elder Range.

Figure 3 – Wilpena Pound<sup>4</sup>



Further south, the Flinders Ranges may be said to comprise steep, high hills with prominent ridges and valleys and large amounts of native vegetation such as Mount Remarkable in Wilmington. This latter type of scenery may, in the Port Pirie region, arguably be found as far south as Napperby. It is **not**, however, found in the hills immediately north of Crystal Brook, where the proposed CBEP is located (and which is zoned 'Primary Production'). To repeat the quote set out above from the LVIA:

*...the Project's immediate landscape character is represented by a partially modified agricultural landscape, comprising lower rounded and sparsely timbered, grassed and cropped hills. The Project Site landscape character is commonly found, and generally ubiquitous, within the broader landscape.<sup>5</sup>*

A similar landscape to that on which the proposed CBEP is located (see Figure 2 above) may be found at Mintaro, where the Waterloo Wind Farm was completed in 2010.

<sup>4</sup> <http://www.traveller.com.au/wilpena-pound-south-australia-travel-guide-and-things-to-do-12mah1>

<sup>5</sup> Executive Summary, LVIA (p 7)

Figure 4 - Waterloo Wind Farm landscape<sup>6</sup>



Neoen also notes that the 'map of the Flinders Ranges' sold by the Friends of the Heysen Trail extends only as far south as Port Germein, approximately 35km north of the proposed CBEP.<sup>7</sup>

Figure 5 - Map of Flinders Ranges<sup>8</sup>



Neoen does not, therefore, accept that the siting of turbines in the agricultural land south of the Wilkins Highway can be equated to placing turbines 'in the Flinders Ranges'.

<sup>6</sup> <http://www.abc.net.au/news/2016-02-09/ian-johnson-generating-power-at-waterloo-wind-farm.jpg/7152228>

<sup>7</sup> <https://heysentrail.asn.au/shop/flinders-ranges-map/>

<sup>8</sup> <https://heysentrail.asn.au/shop/flinders-ranges-map/>

c) Proposed turbines are too large

Many submissions also stated that the proposed turbines are ‘too large’, implying that larger turbines will have greater visual impacts on neighbouring dwellings and Crystal Brook township itself. Neoen makes the following comments in response:

1. Neoen acknowledges that the proposed turbines are, at up to 240m tip height, significantly larger than the 150m machines installed between 2015-2017 at Neoen’s Hornsdale Wind Farm.

However, Neoen emphasises that this is an inevitable trend for new wind developments across Australia in order to continue driving down renewable energy costs and supporting the renewable energy transition. Furthermore, more than half of the original proposed turbine locations for CBEP have been removed. In order to keep the project financially viable and competitive in the energy market, it is essential that the project is able to make use of larger turbines, which result in both higher energy yields and significant savings in terms of civil and electrical works.

2. Neoen respectfully considers that from a planning perspective, the statement that turbines are ‘too high’ has no basis: the South Australian Wind Farm Development Guidelines place no restriction or stipulation on turbine height. Indeed, Neoen believes that the use of larger but fewer turbines will result in a net positive effect on visual impact. This is specifically noted under the ‘Renewable Energy Facilities’ module (General Section of Development Plan), PDC 2, of the South Australian Wind Farm Development Guidelines:  
*‘The number of turbines in an array can be more detrimental than the height of the turbines themselves. The height of wind turbines is a design constraint – the higher the rotor and the longer the diameter of the rotor blade, the greater the amount of electricity produced. Hence, a reduction in rotor height or diameter may lead to an increase in the number of turbines required to generate a particular target output, which may in turn generate other unwanted effects such as firstly, the turbines having a more sizeable geographic footprint and consequential visual ‘untidiness’ and secondly, a corresponding increase in the total amount of land required for the entire development’.*<sup>9</sup>
3. Finally, Neoen rejects the implication that increased size necessarily equates to greater visual impact, for the following reasons:

**i. Setback**

The primary factor in visual impact is distance from the viewer. South Australian planning guidelines prescribe a minimum 1km setback to uninvolved dwellings. The proposed CBEP exceeds this by a comfortable margin, with the nearest uninvolved occupied dwelling to CBEP at 1.31km (H17, a weekender, also separated from the project by the Wilkins Highway), five others between 1.5-2km, and all other dwellings exceeding 2km. The northern edge of the residential portion of Crystal Brook itself (excluding Talbot Road) is around 3.8km from the nearest turbine, while the northernmost tip of Talbot Road is 2.15km from the nearest turbine. Figure 5 shows a photomontage of the view from a house near the tip of Talbot Road.

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<sup>9</sup> <https://www.lga.sa.gov.au/webdata/resources/files/2012.32%20-%20Windfarm%20Development%20Guidelines%20-%20Final%20Report.pdf> p 10



Figure 6 - View from Talbot Road



**ii. Visual screening**

Figure 5 also illustrates the effectiveness of screening in mitigating visual impact, with the trees in the photomontage no more than 4-5m high. Neoen has offered, and will continue to offer, to plant and maintain vegetative screening at all occupied dwellings within 2.5km of a turbine.

From within Crystal Brook township itself, visibility of the turbines will be rare to non-existent, as (excluding Talbot Road) they will be at a distance of over 3.5km from the edge of the town and heavily screened by buildings and trees. See further *Issue 2 – Proximity to town*.

**iii. Larger turbines turn more slowly**

The previous generation of wind turbines, such as the 3.2MW machines installed at Neoen's Hornsdale Wind Farm from 2015-2017, rotate at a maximum of 20 revolutions per minute (RPM) on average. The current generation of turbines proposed for CBEP rotate at a maximum of around 15RPM, in order to keep tip speed within design limits despite their longer blades. This 25% slower rotation makes them significantly less visually conspicuous (and also reduces shadow flicker), which counterbalances the turbines' additional height to a degree.

**iv. Less visual crowding**

As noted above with regard to PDC 2 of state Wind Farm Development Guidelines, larger turbines mean a lower number of turbines relative to a given output, which can lower overall visual impact despite greater height.

## 2. Proximity to Town

Approximately 26% of submissions identified the proximity of CBEP to Crystal Brook township as an issue. The vast majority of these submissions focused on the wind turbines rather than the solar component.

Figure 7 - North-eastern edge of Crystal Brook



Per South Australian and Council planning guidelines, the mandatory setback of wind turbines from 'defined and zoned township, settlement or urban areas' is 2km.<sup>10</sup> At the north-eastern edge of Crystal Brook's residential zone (indicated by a yellow pin in Figure 7), the nearest turbine will be approximately 3.65km away.

Figure 8 is a photomontage taken from the location indicated by the green pin in Figure 6 (a hockey ground). It indicates the size of the

turbines at a distance of 3.9km, and demonstrates that even on the northernmost fringe of Crystal Brook, on the edge of an open field and with no buildings or trees in the foreground, the turbines will be almost entirely screened from view.

Figure 8 - View from northern fringe of Crystal Brook



Figure 9 is a 'visual map' produced by Neoen's visual consultant intended to show the likelihood of views of the turbines from Crystal Brook and surrounds. Considered in combination with Figure 8, it is a conservative assessment and likely to overestimate visibility of turbines.

<sup>10</sup> (a)

[https://www.dpti.sa.gov.au/\\_data/assets/pdf\\_file/0011/250004/Port\\_Pirie\\_Council\\_Development\\_Plan.pdf](https://www.dpti.sa.gov.au/_data/assets/pdf_file/0011/250004/Port_Pirie_Council_Development_Plan.pdf),

(b) <https://www.lga.sa.gov.au/webdata/resources/files/2012.32%20-%20Windfarm%20Development%20Guidelines%20-%20Final%20Report.pdf>

## CRYSTAL BROOK ENERGY PARK

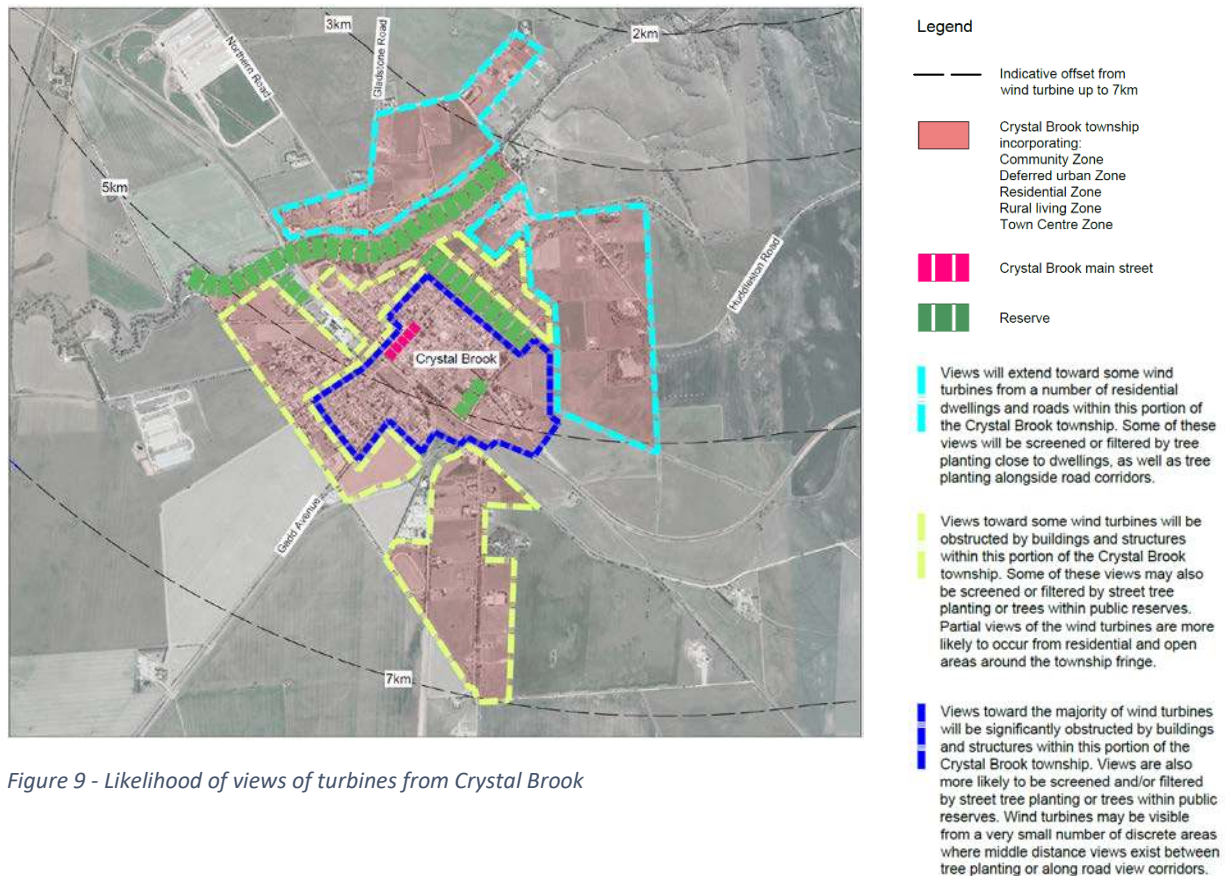


Figure 9 - Likelihood of views of turbines from Crystal Brook

**Based on Figures 7, 8 and 9, Neoen predicts virtually zero visibility of turbines from within Crystal Brook itself, especially in the main business district, while a few houses around the fringes of the town will have distant views able to be largely screened by vegetation.**

Neoen also notes that the 91MW Wattle Point Wind Farm is located approximately 3km south-west of the town of Edithburg in South Australia, on the Yorke Peninsula (population 5500). While the turbines installed at Wattle Point are much smaller than those proposed for CBEP (1.65MW), they are also closer to the town, older (and therefore noisier) and twice as numerous. To the best of Neoen's knowledge, no complaints have ever been received with respect to the Wattle Point Wind Farm.

### 3. Property Values

Approximately 23% of submissions raised the issue of property values, claiming that the proposed CBEP would negatively impact the market values of their homes and properties. These submissions have generally not identified the specific manner in which CBEP would bring about these impacts, but Neoen presumes that the primary concern is deterrence of buyers with reservations about noise, visual impact and health effects, and associated loss of value.

This objection is extremely common in development of renewable (primarily wind) projects both in Australia and overseas. Neoen fully appreciates that for most households, their home is their primary asset and that factors which may affect its value are of deep significance. Accordingly, the company takes concerns regarding property values very seriously.

However, Neoen is not aware of, and has not been presented with, any reliable, impartial research or evidence which establishes a correlation between real estate values and proximity to renewable infrastructure (providing that such infrastructure has been appropriately sited).



The most recent and relevant study carried out in Australia was commissioned by the NSW Office of Environment and Heritage and published by planning consultancy Urbis in July 2016.<sup>11</sup> This report comprised both an analysis of available sales data and a 'literature review' of Australian and international studies (including a 2009 report prepared for the NSW Valuer-General's office). Its conclusions are most easily understood when divided into 'agricultural' and 'lifestyle' land.

### **Effect of wind farms on agricultural land values**

The review concluded that:

1. *'In our professional opinion, appropriately located wind farms within rural areas, removed from higher density residential areas, are unlikely to have a measurable negative impact on surrounding land values';<sup>12</sup> and*
2. *'The literature review...revealed that the majority of published reports conclude that there is no impact or a limited definable impact of wind farms on property values.'<sup>13</sup>*

### **Effect of wind farms on lifestyle properties**

The Urbis review noted that some studies originating from the northern hemisphere (typically characterised by higher population densities) had found a limited correlation between close proximity to wind turbines and the property values of lifestyle (as distinguished from agricultural) blocks. However, based on the case studies conducted by Urbis into various Australian wind farms in NSW and Victoria (Waubra, Taralga, Crookwell, Gullen Range, Capital Wind Farm, Hepburn and Mt Mercer), Neoen notes that the review was unable to establish a similar trend in Australia.

The Urbis study utilised the following parameters:

- Involved (turbine host) dwellings were excluded;
- Properties were included which satisfied the following criteria:
  - o Located within 2km of a turbine;
  - o Sold at least twice between 2001-2016, in order to allow purchase price comparisons.
- This resulted in a total of 20 properties, of which 5 were agricultural and 15 were 'lifestyle' or 'residential'.

As stated above, the study found no measurable effect proximity to wind farms on agricultural land values. Regarding lifestyle/residential properties, the key findings (as summarised by Neoen) were as follows (see Figure 10 below for further detail):

### **Summary**

1. 3 properties (located within the wind farm footprint) experienced positive growth but were purchased by the owner of the wind farm. Neoen considers that these should be disregarded.

#### **Of the remaining 12 properties:**

2. All experienced positive value growth;
3. 4 experienced growth below the average for similar properties in the area, of which:
  - o 1 was surrounded by turbines and 700m from the nearest, and
  - o 1 was located 1km from the nearest turbine;

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<sup>11</sup> Urbis, 'Review of the Impact of Wind Farms on Property Values' (July 2016) accessible online at <<http://www.environment.nsw.gov.au/resources/communities/wind-farm-value-impacts-report.pdf>>

<sup>12</sup> Page 21

<sup>13</sup> Executive Summary, page i



4. 6 experienced growth above the average for similar properties in the area; of which:
  - 1 was improved with a dwelling between the first and second sales, potentially explaining part of its value growth; and
5. 2 experienced growth in line with the average for similar properties in the area.

**Key lessons to avoid impacting property value:**

1. Turbines should not be sited so as to surround uninvolved dwellings;
2. Turbines should not be sited closer than 1km to uninvolved dwellings;
3. Subject to the above, there is currently no evidence that the proximity of wind turbines has a measurable effect on the property values of agricultural, 'lifestyle' or residential properties in Australia.

**Will Crystal Brook Energy Park impact property values?**

1. The vast majority of uninvolved land within 2km of CBEP is comprised of agricultural, rather than 'lifestyle' blocks, on the value of which wind turbines have not been shown to have any effect;
2. CBEP does not surround any uninvolved dwellings (lifestyle or agricultural) with turbines;
3. CBEP does not place any turbine closer than 1.31km to any uninvolved dwelling (lifestyle or agricultural);
4. The project is over 3.5km from any residential area of Crystal Brook (and, as stated above in Issue 1 – Visual Impact, will have low to zero visibility from the town).

Consequently, Neoen does not believe that CBEP is likely to have any measurable impact on real estate values around the project or in Crystal Brook itself.

Figure 10 - Summary of Urbis Study on Property Values

Property Number	Property Type	Property location relative to turbines	Change in value relative to similar properties in the area
<b>Taralga Wind Farm</b>			
1	Lifestyle block and dwelling	Surrounded by turbines, closest 700m	Positive growth, but sold to wind farm developer, sale <b>disregarded</b>
<b>Hepburn Wind Farm</b>			
1	Vacant lifestyle block subsequently improved with dwelling	2km from nearest turbine	Positive growth, substantially <b>below</b> average
2	Lifestyle block and dwelling	1.5km from nearest turbine	Positive growth, substantially <b>above</b> average
3	Lifestyle block and dwelling	2km from nearest turbine	Positive growth, slightly <b>above</b> average
<b>Waubra Wind Farm</b>			
1	Vacant residential block	2km from nearest turbine	Positive growth, slightly <b>above</b> average
2	Lifestyle block and dwelling	Surrounded by turbines, closest 800m away	Positive growth, but sold to wind farm developer, sale <b>disregarded</b>
3	Vacant lifestyle block	1.8km from nearest turbine	Positive growth, substantially <b>above</b> average
4	Vacant lifestyle block	1.7km from nearest turbine	Positive growth, marginally <b>below</b> average
5	Lifestyle block and dwelling	Surrounded by turbines, closest 600m away	Positive growth, but sold to wind farm developer, sale <b>disregarded</b>
6	Lifestyle block and dwelling	1.6km from nearest turbine	Positive growth, substantially <b>below</b> average
7	Lifestyle block and dwelling	1.6km from nearest turbine	Positive growth, <b>in line with</b> average
8	Vacant residential block	1.5km from nearest turbine	Positive growth, <b>twice the average</b>
9	Lifestyle block and dwelling	1.1km from nearest turbine	Positive growth, <b>in line with</b> average
10	Lifestyle block and dwelling	1km from nearest turbine	Positive growth, substantially <b>below</b> average
<b>Mt Mercer Wind Farm</b>			
1	Vacant lifestyle block subsequently improved with dwelling	1.5km from nearest turbine	Positive growth, slightly <b>above</b> average

#### 4. Noise

Approximately 19% of submissions raised concern over noise emissions. The specific grounds raised under this category were as follows:

##### a) Inadequate or improper pre-construction noise monitoring

Neoen engaged South Australian acoustic engineering firm Sonus to conduct the noise impact assessment in the Development Application.

As outlined in the DA, during pre-construction noise monitoring Sonus deployed five noise monitors at various locations and distances around the project for 6 weeks between 7 December 2017 and 24 January 2018. Some submissions claimed that five noise monitoring locations was too few, or that the period of monitoring covered a part of the year characterised by increased ambient noise due to harvesting activities, thus artificially raising the baseline from which the project's noise emissions would be measured after construction and, consequently, the project's noise emissions 'compliance ceiling'.

In response, following consultation with its consultant Sonus, Neoen makes the below comments:

- a) The number of noise monitors utilised by Sonus is in line with industry best practice for the size of project, and more locations would not increase the validity of the findings. Some additional locations (such as H17) were proposed but access was not granted by residents. Relevantly, the EPA has made no criticism of Sonus' noise monitoring process in its comments on the CBEP DA;
- b) The EPA Guidelines background noise monitoring methodology and noise measurement descriptor inherently removes the influence of intermittent or occasional noise sources from the environment.
- c) The proposed wind farm achieves the "baseline" EPA criteria without reliance on elevated background noise levels. **That is, the background noise levels at Crystal Brook do not influence the compliance, or otherwise, of the proposed wind farm with the EPA Guidelines.**

#### b) Larger turbines make more noise

Several submissions implied that because the modern turbines proposed for the project are larger, they will therefore be louder. This assumption, while understandable, is incorrect.

There are several major factors in turbine noise:

1. **Tip speed of the rotating blades as they move through the air:** larger turbines, as mentioned in Issue 1 (Visual Impact), turn more slowly in order to ensure that tip speed remains within design limits, and hence control noise emissions.
2. **Noise made by generating equipment in the nacelle:** the movement of generating equipment inside the nacelle can be a substantial contributor to turbine noise. However, larger generators are not necessarily noisier. More important is the type of technology (for example, geared versus direct drive) and the components selected.
3. **Design and specification for the site:** turbines have control features that can reduce sound power levels even further from the base levels assumed in noise modelling. These controls allow manufacturers to ensure compliance with relevant permit requirements. For example, acoustic siting engineers can adjust turbines to slow down automatically when wind is blowing at certain speeds and directions which would result in unacceptable impacts on downwind sensitive receivers.

Because manufacturers consider sound power levels to be commercially sensitive, Neoen is unable to disclose in this public Response the exact sound power levels of the several turbine models it is considering for CBEP versus those which were used at Hornsdale. However, Neoen can state that despite the likelihood that CBEP turbines will be 1-1.5MW larger than those used at Hornsdale, their base model specifications (even before taking into account any site-specific adjustments) specify that they will emit equal or lesser amounts of noise.

#### c) Conclusion

The noise level generated by a turbine is not directly related to the size of the blades. However, irrespective of the size or noise output of a turbine, the proposed wind farm must achieve the EPA Guidelines at all dwellings. This means that if turbines with higher noise levels are ultimately selected, Neoen will be required to install fewer of them in order to comply with the noise requirements. **Neoen has a clear incentive to make sure that the project is compliant; being forced to de-rate or shutting down turbines will have severe financial repercussions on the project.**

## 5. Telecommunications Interference

Approximately 19% of submissions raised the issue of interference with reception for various forms of technology.

For the CBEP Development Application, Neoen engaged expert consultants to perform a comprehensive study of potential interference with electronic signals. Possible types of impact resulting from wind farms include the following:

1. **Electromagnetic interference (EMI):** This type of interference may occur where electrical infrastructure radiates energy with a frequency within the operating frequency of a radio communications system. As noted in the study, however, all turbines supplied in Australia must comply with Australian Standards on electromagnetic compatibility (shielding, damping etc), as a result of which electromagnetic interference due to radiation is generally accepted to be negligible and is not considered a credible possibility for CBEP.
2. **Physical interference:** Wind turbine towers or blades may physically interfere with radio signals through diffraction (blocking), reflection, refraction or scattering.

The CBEP study considered potential impacts on many types of radio system technologies; for brevity, this response will address only its findings with regard to mobile phone, broadcast television and AM/FM radio reception, which were the major concerns raised in submissions. These findings are summarised below.

### a) Mobile phone reception

1. The study considered cellular mobile telephone service (CMTS) transmitter sites in a 40km radius from the wind farm.
2. CMTS services around the wind farm are provided by three operators (Optus, Telstra and VHA) from multiple base station sites.
3. Given the location of cellular towers in several directions around the wind farm, interference to mobile coverage is anticipated to be 'minimal', except for those operating very close to or among the turbines such as maintenance staff, and, potentially, for those travelling along Wilkins Highway alongside the wind farm.
4. Neoen notes that mobile reception on the section of the Wilkins Highway which is adjacent to turbines (around 'Tank Hill, near CB09) is already poor to non-existent.

### b) (Digital) Broadcast Television Reception

1. The zone of a wind farm's potential interference on receivers of digital TV broadcast is considered to be 10km by the International Telecommunications Union.
2. Key factors which may result in digital TV signal degradation due to turbines include when the receiver is already at the fringe of the TV reception zone, when the receiver is located within 2km of the wind farm, and when the receiver is in line of sight of the wind farm but not of the TV transmitter.
3. All areas up to 10km away from CBEP (the areas most likely to be effect) currently have a high signal quality. Furthermore, the line of sight from the TV transmitter for the Crystal Brook area (Spencer Gulf North) is not blocked by the project.
4. Thus, while a small amount of reception degradation may occur as a result of CBEP, it is likely to be minimal.



c) AM/FM Radio

1. Overseas and local experience indicates that radio reception is unlikely to be affected by operating wind farms.
2. Nevertheless, the study identified a number of AM/FM narrowcast and broadcast services within 40km of CBEP (narrowcast being low-powered services designed for local service only, while broadcast are higher-powered services for wider area coverage).
3. The majority of FM services transmitting in the vicinity of the wind farm are narrowcast services which do not focus on servicing the wind farm area and are thus unlikely to be affected.
4. Broadcast FM services are in a low frequency range and are thus more resilient to interference. There is a 'minor chance' of signal degradation for FM services broadcast from The Bluff (approximately 20km north of CBEP) for receivers very close to the wind farm.

d) Conclusion

Impacts on mobile phone reception and AM/FM radio are expected to be nil, or negligible. Impacts on digital television reception are unlikely, and if any are present, will be minor. However, as per the CBEP Development Application, Neoen commits to the following:

1. Monitoring impacts on digital TV reception by performing pre- and post-construction signal level measurements in and around the wind farm;
2. Where impacts are observed, taking all necessary measures to address them including installation of high-performance antennas, signal amplifiers or satellite dishes on dwellings (at Neoen's cost).

## 6. Health Concerns

Approximately 16% of submissions raised the issue of health impacts from wind turbines.

The primary mechanism by which wind turbines are claimed to affect human health is 'infrasound' – that is, very low-frequency sound caused by the movement of turbine blades through the air, which is below the threshold of human hearing. It is sometimes claimed that infrasound causes a condition broadly characterised as 'Wind Turbine Syndrome', characterised by a range of symptoms such as tinnitus, vertigo, anxiety, uneasiness, fatigue, sleep disturbance, headaches, dizziness or learning and speech difficulties. On the question of health impacts, Neoen notes the following points:

1. Numerous studies have demonstrated that infrasound emissions are by no means unique to wind turbines, also being generated from other natural and artificial sources to which humans have frequent exposure such as waves, the movement of air through trees, air conditioning and vehicles. Infrasound measured from these sources is often comparable to or greater than that emitted by wind turbines. Most relevantly, a study was conducted by the South Australian Environmental Protection Authority<sup>14</sup> in 2013, which made several findings including:
  - a. The measured infrasound levels around wind farms are no higher than levels measured at other locations where people live, work and sleep;
  - b. The characteristics of noise produced by wind farms are not unique and are common in everyday life; and
  - c. The measured levels of infrasound from wind farms are well below the threshold of perception.

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<sup>14</sup> *Infrasound levels near wind farms and in other environments*, January 2013

2. Australia's peak governmental medical body, the National Medical Health and Research Council, conducted a review into wind farms and human health which concluded in 2015 that there is '*no consistent evidence that wind farms cause adverse health effects in humans.*'<sup>15</sup>

Notwithstanding the above, Neoen acknowledges that there is still significant concern among some community members regarding the effects of wind turbines on human health. While Neoen does not accept there is any scientific basis to these concerns, it does accept that the anxiety and stress associated with them, as well as potential placebo effects, may result in real, physical symptoms.

While Neoen cannot entirely prevent anxiety and stress resulting from misinformation, the company has sought, throughout development of CBEP, to communicate as openly as possible and answer concerns raised by community members thoroughly and transparently. As well as responding to inquiries and questions from individuals, Neoen provided information on this issue at both of its Community Open Days in 2017 and 2018, and will continue to do so throughout the life of the project. Neoen also notes that it has had no health-related complaints at its 309MW Hornsdale Wind Farm near Jamestown over the several years it has been in operation.

## 7. Tourism Impact

Approximately 14% of submissions claimed that CBEP would have negative effects on tourism in Crystal Brook (while not detailed in submissions, Neoen presumes this concern revolves around to visual or noise impacts).

Neoen understands that tourism is an important growth component of the local economy. It does not, however, accept the premise that CBEP will have a negative impact on this industry, for the following reasons:

### a) Tourism attraction

CBEP is a pioneering project, one of the largest proposed integrations of wind, solar, storage (and potentially hydrogen) in the world, and, like the Hornsdale Wind Farm and Power Reserve in Jamestown, is likely to attract visitors to Crystal Brook. The battery, in particular, has drawn worldwide attention to Jamestown. Neoen and the Northern Areas Council are currently considering placing a viewing platform above the Hornsdale site (in addition to the information board located in Jamestown).

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<sup>15</sup> <https://www.nhmrc.gov.au/media/releases/2015/nhmrc-s-comprehensive-review-finds-little-evidence-adverse-health-effects-wind-f>

Figure 11 – Neoen’s Hornsdale Wind Farm and Power Reserve (Tesla ‘Big Battery’) Information Board in Jamestown



#### b) Stimulating growth in hospitality and accommodation

CBEP will result in the creation of hundreds of jobs during construction, a smaller number of ongoing jobs for 25-30 years, and the investment of many tens of millions of dollars into the local economy. This will create significant benefits for local hospitality and accommodation businesses, which are key to attracting tourism to regional towns. Again, Jamestown provides a good example, with several local businesses having been started or expanded during the construction of the wind farm. Neoen invites SCAP to verify the positive effect of the wind farm on Jamestown by contacting Denis Clark, mayor of the Northern Areas Council.

#### c) Negligible visual or noise impact

Aside from the benefits described in (a) and (b), the premise of the claim that the project will negatively affect tourism is false, since visual and noise impacts on the town will be negligible. As discussed above, the project will be inaudible and all but invisible from the Crystal Brook township, especially the main business area, from which the nearest turbine is at a distance of over 4km.

### 8. Flora and Fauna

Approximately 11% of submissions raised the issue of CBEP’s impact on flora and fauna, particularly bird life.

As noted in the Flora & Fauna section of the CBEP DA, the project site has been under development since 2003, when Origin Energy first began investigating it. As a result, from an ecological perspective it has been comprehensively studied over a very long period:

1. Preliminary ecological investigations by Biosis Research around 2003;
2. Detailed ecological investigations by Biosis Research in 2009;
3. Additional studies by Sinclair Knight Merz in 2011;
4. Ecological assessment report by Biosis Research in 2012;
5. EBS Ecology engaged by Neoen in 2017 to:
  - a. Review previous ecological assessments; and

- b. Conduct new field assessments:
  - i. Flora and fauna field survey from 27<sup>th</sup> February to 2<sup>nd</sup> March 2017;
  - ii. Follow-up survey in May 2017;
  - iii. Second follow-up survey in February 2018.

Neoen will not attempt to restate the results of these investigations, which are outlined and summarised by EBS Ecology in the DA study, but will instead emphasise the following primary points:

a) Flora

- 1. Virtually all of the proposed solar site comprises cropping land with negligible environmental value (some remnant native vegetation in gullies).
- 2. Of the proposed wind turbine locations, all are currently subject to varying levels of degradation from past and ongoing grazing usage.
- 3. 3-4 proposed turbine locations along the eastern side of the ridge are characterised by remnant native vegetation of moderate to high quality and habitat value including mallee, peppermint box and she-oak, and any clearing of this vegetation is likely to require offsets fulfilling the 'Significant Environmental Benefit' criteria under the *Native Vegetation Act*.

These sites are among the most productive at Crystal Brook in terms of energy yield, and their retention is key to the viability of the project. However, Neoen commits to:

- a) micrositing as required, in consultation with EBS Ecology, to mitigate impacts to the maximum extent possible; and
  - b) acquiring any offsets required under the Native Vegetation Act, noting that there is likely to be suitable land elsewhere on the site which is currently grazed, but which is characterised by substantial remnant vegetation which may be ideal for protection and rehabilitation.
- 4. EBS' report raised the possibility of the occurrence of several threatened orchid species around some turbine sites in the south of the project. None had been found to date by EBS or Biosis, but as was noted by EBS (and the Department of the Environment in its comments), these surveys largely took place in summer or autumn and these orchid species would not be visible until spring.

Neoen subsequently engaged EBS to conduct a follow-up survey in late September 2018 (the orchids would be most visible in spring), with the result that no orchid species were found. Please see **Appendix 1 (sent separately)** for a copy of this report.

If orchids are found at a later date, Neoen commits to taking the following mitigation actions, as necessary, in consultation with EBS:

- a) fencing off orchids to protect them from grazing (to which they are already subject);
  - b) micrositing turbines to avoid the orchids; or
  - c) where micrositing is not possible, translocating orchids to suitable new locations (EBS has advised that, although difficult, this is possible).



b) Fauna

1. From database searches, EBS identified the CBEP site as potentially forming habitat for two threatened species of lizard – the Flinders Worm-Lizard and the Pygmy Blue-Tongued Lizard. Previous searches conducted by Biosis Research for these species did not indicate the presence of either species of reptile.
2. Several submissions focused on the impact of CBEP on bird species. Such concerns are common in development of wind projects and should be treated seriously – however, Neoen believes that the risks have been overstated. Neoen notes the following:
  - a. Both Biosis and EBS note the presence of two bird species of state conservation significance on the CBEP site: the Diamond Firetail and the Hooded Robin. Research conducted by Biosis indicated that these smaller, lower-flying species will rarely, if ever, fly at a height coinciding with the swept areas of wind turbines – especially large, modern models with swept areas over 50m above the ground. The primary potential impact of CBEP on these species is loss of habitat due to removal of native vegetation. However, Biosis noted in its 2012 report to Origin Energy that removal of some native vegetation at a few turbine sites (albeit not in the same locations as the current proposal) will result in a very small amount of habitat loss relative to the overall site.

EBS also notes several types of habitat the preservation of which should be prioritise to avoid impacting these species, which Neoen will commit to taking into account wherever possible via micro-siting. Where some clearance is unavoidable, Neoen will also commit to acquiring offsets (preferably on-site) to restore habitat.

- b. EBS also located two Wedge Tailed Eagle nests. Wedge-Tailed Eagles are not a listed species but are considered to be rare in the region. Raptors are at greater risk of collision with turbines due to flight height, but (as noted by EBS) some studies have indicated that they display adaptive avoidance behaviours in proximity to wind turbines.

Only one nest remains at CBEP following the collapse of the second due to supporting limb failure following a storm. Though apparently unused for several years, this nest remains potentially viable and consequently Neoen has implemented a 500m buffer around it in accordance with the recommendations of EBS. The Department's comments indicate support for this strategy, also noting that collision risk modelling may be desirable. Neoen will investigate this modelling further in consultation with EBS.

## 9. Lack of Consultation

Approximately 5% of submissions raised the issue of lack of public consultation about the Crystal Brook Energy Park. Neoen makes the following responses to these claims:

a) Robust process

Neoen conducts community engagement activities in accordance with our Community Engagement Policy and bespoke Engagement Plans which are developed for each project. These documents are based on the *Best practice community engagement in wind development* (2014).<sup>16</sup> Neoen has invested significant time and resources in conducting a robust community engagement process regarding the Crystal Brook Energy Park.

Preparation of the Community Engagement Plan and stakeholder mapping occurred in late 2016. In early 2017, the project website was launched and Neoen commenced meeting with project neighbours. Neoen held an initial Community Information Session in February 2017, presenting a draft preliminary layout, fact sheets, posters and photomontages from three different viewpoints. At this time, Neoen also commenced engagement with the Beetaloo Valley Association (BVA), a group of approximately 40 landholders who live to the north-east of the project. Over the course of the following months, Neoen held two subsequent meetings with the BVA and one-on-one meetings with several members.

In March and April 2017, Neoen commenced engagement with representatives of the Nukunu Peoples' Council. Neoen has a strong relationship with the Council, having worked with them on the Hornsdale Wind Farm located near Jamestown. In May/April, Neoen briefed the State members for Frome and Stuart and the Federal member for Grey.

Neoen has also consulted with numerous government agencies and departments, including the Environment Protection Authority, the Northern and Yorke Natural Resources Management Board, the Department of Defence, Air Services Australia and the Civil Aviation Services Authority.

Neoen held a second Community Information Session in February 2018 presenting the revised layout. The Information Session was well-attended and overall feedback was positive. Around this time, Neoen also met again with representatives of the BVA to present the revised layout with all northern turbines removed. The BVA advised Neoen that it would prefer if the

Neoen also notes that to the best of its knowledge, the National Wind Farm Commissioner's office has never received a complaint about community engagement at Crystal Brook Energy Park.

b) Incorporation of feedback

In terms of opportunities for community members to comment on the project, Neoen notes that the Crystal Brook Energy Park has been in the public domain since January 2017 when the project website was launched. The Development Application for the project was submitted in March 2018. This timeframe has provided community members with a 14-month window within which to provide feedback.

Feedback mechanisms have included:

- Providing feedback to the project team via one-on-one meetings;
- Providing feedback to the project team via group meetings;
- Providing feedback to the project team via Community Open Days;
- Completing a Community Feedback Form in person or via the project website;
- Emailing the project team at [contact@crystalbrookenergypark.com.au](mailto:contact@crystalbrookenergypark.com.au);
- Calling the project team via the Neoen hotline; and
- Writing letters to Neoen Australia.

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<sup>16</sup> Taryn Lane and Jarra Hicks, *Best practice community engagement in wind development* (2014), accessible at <http://cpagency.org.au/wp-content/uploads/2014/03/Attachment-E-Best-practice-community-engagement-in-wind-development-FINAL-V1.0.pdf>.

The level of engagement at Crystal Brook has gone well beyond an ‘inform or consult’ level, as feedback from the community and Council has resulted not merely in refinements to project design, but the voluntary removal of over half the turbines in the original layout.

The original project design covered areas of land within the jurisdiction of the Northern Areas Council and the Port Pirie Council and included turbines in both the Primary Production and RLP Zone (planning policy for which does not exclude turbines). Neoen briefed executive members of the Port Pirie Council and the Northern Areas Council in December 2016. In response to community concerns regarding the suitability of the RLP Zone for the development of renewable energy projects, Neoen presented a revised layout in April 2017 which removed all turbines from this zone.

On 29 May 2017, Neoen received a letter from the Port Pirie Council noting that it had passed a resolution to oppose the revised layout, which still contained some turbines in the Ranges Zone to the north of the project. Council’s primary concern was that it did not feel that wind turbines were consistent with the Development Plan in respect of this Ranges Zone. Verbally, Council informed Neoen that while landscape values were similar between this area and the southern area of the project, it wished to retain the area north of the Wilkins Highway as a ‘development buffer’ for the Flinders Ranges ‘proper’ (that is, the more rugged, rocky escarpments significantly further to the north-west). It also noted that it had received various submissions from community members opposing turbines to the north (primarily the Beetaloo Valley Association).

Following this letter, Neoen paused further development activities to redesign the project. As part of this, all turbines north of the Wilkins Highway (over half of the original wind component) were removed. This also meant that approximately half of the original landholder group would no longer receive turbines on their land. These landholders were disappointed but understood the reasoning behind the decision.

To keep the project financially viable after this reduction in turbine numbers, Neoen has explored two avenues:

1. Increasing the size of the remaining turbines to a maximum tip height of 240m (due to a greater ‘swept area’ and the ability to access better wind speeds found at higher altitudes, larger turbines significantly improve energy yield and therefore project economics);
2. Engaging with another landholder to the south-east of the project (not part of the original group) to explore the possibility of placing turbines on his land. Used for cropping, this land is considerably flatter and less elevated than the rest of the project and thus possesses a lower wind resource. With the larger proposed turbines, however, these locations would still be viable.

In early November 2017, Neoen met again with senior members of the Port Pirie Council to discuss the redesigned project. The redesign of the project also took into account concerns expressed by the Beetaloo Valley Association.

## 10. Development Application

Approximately 4% of submissions raised the concern that the DA contained inconsistencies and errors.

Neoen confirms that there were a number of minor errors in the original Development Application. For example, the Traffic Impact Assessment refers to a layout comprising 29 turbines in section 3.2, rather than the correct number of 26. These errors largely arose as a result of the project layout having undergone numerous evolutions over the course of Neoen's extensive 12-month consultation with Council and local residents, with some document updates being overlooked between versions. Since the DA is comprised of collated input from numerous experts (for example, traffic management experts must prepare the Traffic Impact Assessment, while visual impact assessment experts must prepare the Landscape and Visual Impact Assessment), it can be challenging to ensure total consistency from study to study and version to version.

Neoen has rectified any material errors as they have been brought to its attention, most importantly relocating one proposed turbine which was mistakenly positioned approximately 100 metres inside Port Pirie Council's Rural Landscape Protection Zone. This error arose because Neoen had not realised that the Landscape Protection Zone extended south of the highway onto cropping land. The proposed turbine location has now been moved approximately 200 metres south into a Primary Production Zone. Neoen understands that Port Pirie Council and the Department of Planning have accepted this rectification.

Neoen also wishes to clarify the statement made on page 3, Volume 1 of the DA that under the current layout, *'no Beetaloo Valley Association dwelling is closer than 2.9km to a turbine'*.

Some submissions misunderstood this statement as a representation that no proposed turbine is closer than 2.9km to a **resident** of Beetaloo Valley. **This is not what the DA says.** H17, located on the fringe of Beetaloo Valley next to the Wilkins Highway, is indeed located 1.31km from the closest turbine. However, the owner of H17 is not, in Neoen's understanding, a member of the Beetaloo Valley Association.

While it may appear unusual to refer to Association members rather than residents, the project history provides some context: Neoen has been engaging and negotiating specifically with the Beetaloo Valley Association in its collective capacity throughout the development of the project, and has made numerous concessions in direct response to requests from the Association. The owner of H17 did not attend any of the several meetings held by Neoen with the Association, nor did they respond constructively to Neoen's attempts to set up a dialogue on the project, including with regard to conducting noise monitoring at H17. Consequently, Neoen assumed that Mr Wooley was not an Association member.

If this assumption was incorrect, then Neoen regrets the error. Even if it is correct, Neoen regrets the misunderstanding and accepts responsibility for the misinterpretation of the '2.9km' figure.

**However, Neoen also notes that a setback of 1.31km nevertheless exceeds planning guidelines by a margin of 30% - consequently, the misunderstanding does not affect the project's planning compliance.**

## 11. Traffic

Approximately 4% of submissions raised the issue of traffic impacts – primarily, the inconvenience of heavy vehicles on local roads, and the viability and safety of the main proposed site access point on the Wilkins Highway. Drawing upon the Traffic Impact Assessment performed by expert consultants at GHD and contained in Volume 2 of the DA, Neoen makes the following comments:



a) Heavy vehicle traffic

Some submissions raised concerns that construction traffic volumes would present substantial inconvenience to local residents.

Neoen acknowledges that a level of inconvenience during the construction phase from heavy vehicle movements is likely to be inevitable if CBEP is constructed. This is not unique to wind and solar projects, but applies to construction of any large project, as well as transport of commodities such as livestock or produce. However, given local road networks and existing traffic volumes, these impacts will not be excessive and are well able to be mitigated via a thorough Traffic Management Plan (TMP) to be agreed with Council and DPTI prior to construction. Some examples of mitigation strategies are:

1. Keeping all heavy vehicle traffic away from Crystal Brook;
2. Deliveries scheduled during off-peak times whenever possible;
3. Regular monitoring of road condition to check for degradation caused by project traffic, and prompt repairs (at Neoen's cost) where such degradation occurs;
4. A thorough community consultation and awareness program to inform local residents.

b) Site access

The Traffic Impact Assessment identified a potential access point on the Wilkins Highway. Public submissions and comments from DPTI identified this as potentially problematic due to vertical and horizontal curves that limit sightlines, and the existence of an overtaking lane.

Following this feedback, Neoen agrees that the proposed access point on the Wilkins Highway may not be a viable option at this stage. Comments from DPTI note other options for site access, including Hughes Gap Road and Hatter's Road. Neoen considers that these access points are valid potential alternatives, but notes that access must avoid routing heavy vehicle traffic too close to Crystal Brook.

**Neoen proposes a condition that it must work with Council and DPTI on the Traffic Management Plan to find safe and satisfactory access points to all parts of the site (to the reasonable satisfaction of Council and DPTI).**

## 12. Aerial firefighting

Approximately 4% of submissions raised the issue of the impact of turbines restricting aerial firefighting.

The Crystal Brook region is prone to hot, dry summers, and Neoen fully appreciates the importance of facilitating firefighting access. However, drawing upon the Aeronautical and Aviation assessment contained in the CBEP DA, it is likely that the project will in fact reduce the overall risk and potential impact of fire in the region, noting the following:

### 1. Wind farms conduct lightning strikes safely

As very tall structures, turbines tend to attract lightning strikes which would otherwise have hit trees. Turbines are designed to deal with such strikes, and reduce the likelihood of a fire being started by conducting them safely to earth.

## **2. No special aviation risks associated with turbines**

Fire authorities generally consider aerial firefighting a secondary, complementary tactic to ground-based operations. The South Australian CFS has noted that: *‘The popular perception amongst much of the population is that aircraft alone can put out bushfires. This is not true. CFS firefighters and fire appliance for the vast majority of instances are the primary and only method of controlling bushfires.’*<sup>17</sup>

Authorities also do not consider that turbines pose unique issues in aerial firefighting. Pilots view turbines as no different to other tall structures and hazards such as power lines, transmission towers, radio masts, mountains and valleys; turbines are simply another piece of infrastructure in the environment that needs to be managed on a risk basis when fighting fires. Pilots fly by sight and will not fly into smoke. Wind turbines, if not covered by smoke, are easily visible in the environment.

Regarding the hazard posed by moving blades to pilots, turbines will generally be turned off and locked as soon as requested by firefighters, as occurred at a recent grass fire near the Waterloo Wind Farm.<sup>18</sup> Neoen maintains a 24-hour control room in Canberra which is able to turn off turbines remotely, in addition to local maintenance staff and technicians. However, the Australasian Fire and Emergency Services Council (AFAC) position paper on Wind Farms and Bushfire Operations also concluded that *“wind turbines are not expected to pose increased risks due to wind turbulence or the moving blades. Local wind speeds and direction are already highly variable across landscapes affected by turbulence from ridge lines, tall trees and buildings.”*

## **3. Wind farms facilitate ground-based firefighting**

Wind farms offer several benefits to ground-based firefighting efforts:

1. Construction and maintenance of access tracks in previously inaccessible areas such as steep hills and ridges greatly improves access for ground-based firefighting units, which are the primary means of fighting fires;
2. Access tracks also act as firebreaks, as in the recent Waterloo grass fire;
3. Frequent staff presence resulting in greater oversight and potential earlier notification of fire;
4. Reduction of fuel load by regular slashing of grass and removal of debris;
5. On-site firefighting resources to augment local firefighting capabilities, including water tanks and firefighting equipment – especially during construction.

## **Conclusion**

In its response to the CBEP DA, the Country Fire Service offered no objections to the project, but stated its support for development in regional and rural areas of South Australia. It also specified several ways in which the project should be designed to facilitate firefighting, such as access road gradients, water sources and firefighting equipment. Neoen will be happy to comply with all such specifications, as it did throughout construction of Hornsdale Wind Farm and Power Reserve.

## **13. Updating Guidelines**

Approximately 3% of submissions claimed that planning guidelines should be made more restrictive, especially in light of the increased size of modern turbines.

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<sup>17</sup>

<sup>18</sup> <https://www.cleanenergycouncil.org.au/news/2017/october/in-case-of-fire.html>

Neoen does not intend to comment on the adequacy of current planning guidelines as this is a matter for the South Australian government and rule-makers, and will make only the following statements:

1. Larger turbines are not necessarily more impactful. In particular:
  - a. Noise emissions from modern turbines are generally lower than older generations due to improvements in design; and
  - b. While larger, modern turbines are also spaced further apart, resulting in a less crowded landscape, and rotate more slowly.
2. CBEP has been designed to achieve compliance with all current planning laws and guidelines, and in most respects (such as setback from uninvolved dwellings) exceeds them by a significant margin.

Like any other proponent, Neoen must design its projects within the framework of the law as it stands. If planning laws are changed, Neoen will of course comply with these changes for all future development applications.

#### 14. Community Cohesion Impact

Approximately 5% of submissions raised the issue of community cohesion.

Neoen considers that it is not uncommon for differing views to arise within communities when there are differing views on local issues or projects. As a relatively new form of development, renewable energy may be subject to particularly strong views among some community members.

However, Neoen does not accept the premise that the Crystal Brook community has become fractured over the CBEP proposal. Neoen's engagement with local community over the course of project development, including numerous meetings, informal discussions and open days has indicated predominantly neutral or favourable attitudes toward the project. The majority of opposition has originated from the Beetaloo Valley Association, a small group concentrated in the Beetaloo Valley area, which has campaigned strongly against the project since investigations of the site were first begun by Origin Energy over 12 years ago. Neoen's efforts to compromise with the Association, including the removal of all northern turbines, have not been successful to date, but Neoen will continue to strive for a productive dialogue.

Throughout the engagement process more generally, Neoen has worked to avoid disunity in the local community through:

- Respecting the right of residents to hold different views regarding the project;
- Continuing to meet with and respond to opponents of the project even where compromise is rejected;
- Consulting with a wide range of stakeholders in relation to the project;
- Urging project supporters to respect the right of people opposing the project to display their views;
- Committing to establishing a Community Fund administered by local stakeholders to share project benefits with the wider local community.

#### 15. Decommissioning

Approximately 3% of submissions raised the issue of decommissioning, with some implying that Neoen had no plan or intention to decommission the project after its operational life.

Neoen rejects this implication in the strongest possible terms, noting that decommissioning was discussed explicitly throughout the DA, most particularly on pages 28-29. Neoen also notes that:

1. It is bound to decommission the project and rehabilitate the site under its agreements with host landholders;
2. A generation licence from the Essential Services Commission of South Australia (ESCOSA) granted under the *Electricity Act 1996* (SA) must be granted prior to any operations. The *Electricity Act 1996* states that licences must require a generator to prepare and periodically revise a safety, reliability, maintenance and technical management plan. Under the *Electricity (General) Regulations 2012* (SA), this plan must cover the safe decommissioning of electricity infrastructure.
3. **Neoen fully expects (and supports) the DA to be conditional on Neoen providing a satisfactory Decommissioning Plan to Council, DPTI and DEW.**

Regarding specific components, Neoen commits to the following (further detail to be provided in the Decommissioning Plan):

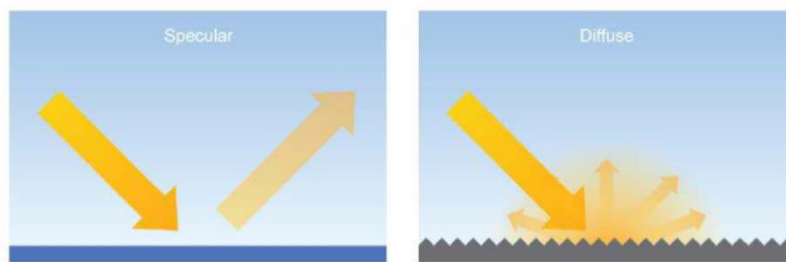
1. All above-ground infrastructure including wind turbine towers, blades and nacelles, as well as solar PV panels and batteries, will be removed at the end of their life-span for disposal and potential recycling;
2. Underground cables will be left in place – an established practice based on minimising disturbance to vegetation which has recovered since the project was constructed; and
3. Any concrete foundations for turbines, batteries, ancillary structures etc will be removed to a depth of at least 300mm below the surface and the foundation area will be covered with appropriate substrate and top soil to facilitate revegetation and/or agricultural use. Again, leaving the bottom parts of foundations in place is standard practice – buried concrete has no negative effect on visual amenity, the environment or agricultural activities, and avoids the destructive removal of large amounts of concrete.

## 16. Solar Panel Glare

Approximately 1% of submissions raised the issue of solar panel glare.

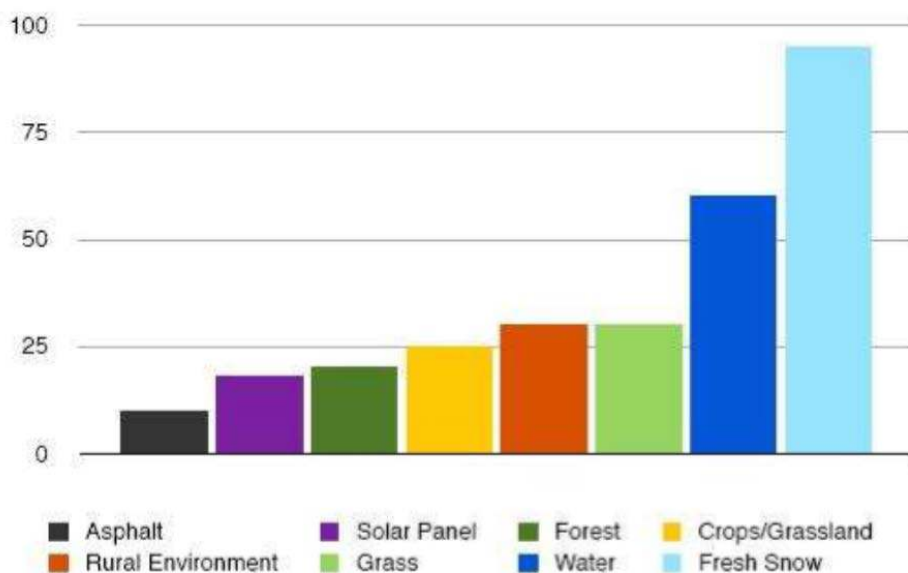
Neoen notes that solar panel glint and glare was discussed in the Landscape and Visual Impact Assessment section of the CBEP DA. ‘Glint’ results from the direct reflection of sunlight (specular reflection) from a reflective surface that would be visible when the sun reflects off the surface of the PV panels at the same (single) angle that a person is viewing the PV panel surface – this will appear more like a ‘flash’ from a mirror. ‘Glare’ results from the reflection of sunlight at many angles (diffuse reflection), and will appear more like a generalised brightness, such as from snow. Due to low overall reflectivity, solar panels are more likely to cause glare than glint.

Figure 12 – Glint vs Glare<sup>19</sup>



The LVIA noted that the primary function of photovoltaic (PV) cells is to absorb light rather than reflect it. The panels will therefore include an anti-reflective coating on the solar cell wafers within each panel, and high-transmission, low iron glass, which absorbs greater amounts of light and reflects less than standard glass. This will result in a surface which will reflect around 2% of light – less than forest or grass. Any minor glare can be further minimised with screening vegetation.

Figure 13 – Comparative Reflection Analysis<sup>20</sup>



The DA concludes that ‘Based on the results of previous assessments for PV solar power projects and studies carried out in a number of countries, the potential for sun glint and glare would not be expected to have a significant impact on residential dwellings surrounding the proposed solar facility, or upon motorists or people travelling through or over the surrounding landscape. This LVIA has noted the relatively significant amount of vegetation in the landscape surrounding the proposed Project Site, as well as the screening influence of local topography. Given the vast majority of residential dwellings will not have a line of sight toward the proposed solar panels, the potential for sun glint to create a significant visual impact is considered to be low.’<sup>21</sup>

<sup>19</sup> (US) Federal Aviation Authority

<sup>20</sup> <https://www.solarchoice.net.au/blog/solar-panels-near-airports-glare-issue/>

<sup>21</sup> pp 75-76



## 17. Clustering effects

Approximately 2% of submissions raised the issue of ‘clustering effects’ – a term also employed by Port Pirie Council in its agency response.

These submissions have generally provided little detail on the nature of ‘clustering effects’, stating primarily that there is potential for an increased level of noise emissions as result of several turbines being located relatively close together – perhaps due to the effects of turbine-induced turbulence. However, neither Neoen nor its expert consultants on wind turbine noise or layouts are aware of this term, nor understand how such an effect would occur, and are not aware of any previous academic or technical literature which supports its existence. To the best understanding of Neoen and its consultants, noise emissions from a group of turbines is no more than the sum of the noise emissions from each individual turbine. After several decades of industry experience, this noise is well-understood and able to be modelled accurately.

The implication of the submissions raising ‘clustering effects’ is presumably that the pre-construction noise modelling conducted on CBEP, by not taking these effects into account, will underestimate the actual noise likely to be emitted by the project, and that CBEP will consequently have greater noise impacts than anticipated. Even assuming the existence of ‘clustering effects’, such a scenario would not alter Neoen’s obligations to comply with noise limits. If Neoen miscalculates CBEP’s noise emissions and noise limits are exceeded at nearby sensitive receivers, Neoen will be obliged to de-rate or shut down turbines to achieve compliance (as outlined in detail in Issue 4 – Noise).

## 18. Safety Risk

Approximately 1% of submissions raised safety issues – specific concerns included the risk of turbines catching fire, and setback from public roads in the event of turbine ‘failure’.

### a) Fires started by turbines

As noted above, the Country Fire Service has offered no criticism of CBEP, requesting only standard conditions with which Neoen will be happy to comply. CBEP will also be subject to a detailed fire risk management plan with on-site emergency vehicle and other equipment during construction, which, due to high levels of activity on site, is by far the highest-risk period of any project.

Regarding the risk of fires started by turbines more generally, Neoen is aware of only four turbine fires in Australia: Ten Mile Lagoon in the mid-1990s, Lake Bonney in January 2006, Cathedral Rocks in February 2009, and Starfish Hill in October 2010. Of these, all were quickly contained and no significant property damage occurred (other than to the turbines).

Over the 15 or so years since wind turbines have begun to be installed more widely, millions of ‘turbine operating hours’ have been accumulated across the industry. The extremely low incidence of turbine fires compared to other causes of fire in rural areas (vehicles, machinery and haystack combustion are some examples) indicates that the technology is extremely safe. These statistics also do not take into account the number of lightning strikes (an extremely common cause of bushfires) which have been safely earthed by turbines.

Neoen notes that while there has now been no turbine fire reported for over 8 years as turbine technology (including fire detection and suppression systems) has matured rapidly, fossil fuel plants have an increasingly poor record in terms of both frequency and seriousness of fires. Further, over the 2017-2018 summer, three fires broke out at Victorian coal fired power stations,<sup>22</sup> and in 2014, the Hazelwood Coal Mine Fire burned for 45 days, destroyed around 45 homes in Morwell, caused around \$100 million in damage and potentially contributed to the premature deaths of 11 persons from pollution.<sup>23</sup> A fire also broke out at AGL's Torrens Island gas-fired power station in 2017.<sup>24</sup> While any generation of electricity or operation of large machinery carries inherent risk, it is clear that renewable sources, which do not rely on combustion, have an excellent record to date.

#### b) Setback from public roads

One submission claimed that the turbines at CBEP are not set back far enough from public roads, and that turbine 'failure' (presumably breakage of the tower or blades) is a risk to road users.

Neoen notes, firstly, that there are only small number of turbines proposed for CBEP near public roads, and of those, only one (CB09) is near a road with significant traffic volumes – the Wilkins Highway. Secondly, Neoen is not aware of any wind turbine having fallen over, or of any blade having fallen from an operational turbine, in Australia. Turbines used in Australia (including at CBEP) are manufactured and installed according to strict standards, and guaranteed fit for purpose. The chance of a tower or blade falling and causing injury to a motorist is negligible.

### 19. Shadow Flicker

Approximately 1% of submissions raised the issue of shadow flicker.

Shadow flicker is a valid and important concern in wind project development. As part of the CBEP DA, Neoen engaged expert consultant DNV-GL to conduct a shadow flicker model. Shadow flicker is quite predictable since it relies significantly on known quantities (the movement of the sun, the location of turbines).

Neoen notes the following points from the DA:

1. In line with the Draft National Guidelines, the impact of shadow flicker is typically only significant for a distance of up to 265 times the chord of the blade, or, for modern turbines, which typically have maximum blade chords of 4-6m, between 1000 and 1600m. Beyond this distance the shadow is diffused such that the variation in light levels is not likely to be sufficient to cause annoyance. The Draft National Guidelines state that *"no assessment is required for residences beyond this distance"*. DNV-GL utilised a maximum shadow distance of 1580m.
2. The model utilises a number of 'worst case scenario' assumptions and simplifications to predict 'theoretical annual shadow flicker', the most significant of which are:
  - a. that the blades of the turbines are always perpendicular to the direction of the line of sight from the dwelling to the sun;
  - b. that the turbines are always rotating;
  - c. that there is no vegetation or other screening at dwellings; and

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<sup>22</sup> <https://www.smh.com.au/business/the-economy/victorian-coal-power-station-failures-put-nem-reliability-at-risk-20180409-p4z8l9.html>

<sup>23</sup> <http://www.abc.net.au/news/2014-09-12/hazelwood-mine-fire-pollution-blamed-for-11-deaths/5740824>

<sup>24</sup> <https://www.adelaidenow.com.au/news/south-australia/fire-at-torrens-island-power-station/news-story/c105f9b15c3cbd78a7d6cb3080c69401>

- d. that there are clear skies every day of the year (noting that cloud cover in the area averages 47% on an annual basis, and a proportionate 47% reduction in shadow flicker is a reasonable assumption).

The 'predicted actual annual shadow flicker' is a figure which makes allowances for the above assumptions and simplifications, and results in a more realistic estimate of actual impacts.

3. Recommended maximum annual shadow flicker duration is:
  - a. **Theoretical:** 30 hours per year
  - b. **Predicted actual:** 10 hours per year
4. Four dwellings within 1580m of a turbine are predicted to experience some shadow flicker (H12, H13, H15 and H24).
5. Of the four, three (H12, H13 and H15) will experience shadow flicker in excess of the recommended limits, but all three of these dwellings are owned by involved landowners, and one (H13) is near derelict and will be demolished by the owner (whose primary residence is H12).
6. The fourth dwelling, H24, will experience (at first storey height) a theoretical shadow flicker of 6.8 hours per year (22.6% of the recommended theoretical limit of 30 hours), and predicted annual shadow flicker of 1.2 hours per year (12% of the recommended predicted actual limit of 10 hours). Neoen commits to minimising this still further by planting and maintaining vegetative screening, subject to the preferences of the owners of H24.

## 20. Using Arable Land

Approximately 0.4% of submissions raised the issue that the solar panels at CBEP would occupy arable land which could otherwise be used for agriculture.

Neoen's position is that land use is the prerogative of planning authorities and landowners. Neoen also considers that solar photovoltaic infrastructure is a clean and cost-effective source of a commodity which is essential to human society – electricity – and is thus a valid and valuable use of land. Finally, Neoen notes that solar development is an envisaged land use under the Port Pirie Council planning guidelines.<sup>25</sup>

It should also be noted that traditional grazing practices can be compatible with solar developments. Neoen has conducted a successful trial at its solar farm in Parkes, NSW, where sheep were permitted to graze among the panels. This both allowed the farmer to continue using the land for agricultural purposes and helping to manage vegetation.

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<sup>25</sup>[https://www.dpti.sa.gov.au/\\_data/assets/pdf\\_file/0011/250004/Port\\_Pirie\\_Council\\_Development\\_Plan.pdf](https://www.dpti.sa.gov.au/_data/assets/pdf_file/0011/250004/Port_Pirie_Council_Development_Plan.pdf)

*Figure 14 – Sheep at Parkes Solar Farm, NSW*



## 21. Does not support renewable energy

Approximately 1% of submissions stated a lack of support for renewable energy in general. Neoen believes that the environmental and economic benefits of renewable energy speak for themselves, and makes no comment on this issue.

## Chapter 2 – Port Pirie Regional Council Submission

Neoen thanks the Council for its valuable feedback on the CBEP proposal, and offers the following responses.

### 1. Planning

Council has noted that under the State Wind Farm Develop Guidelines, the Desired Character for the Primary Production Zone does ‘envisage wind farm development within valuable scenic and environmental areas’. Council also notes, however, that in its own (council) Development Plan, PDC 13 places ‘further conditions’ on Primary Production Zone areas *‘east of the National Highway 1 up to the RLP Zone, where development is designed and sited to ensure the natural views of the Flinders Ranges are not impaired’*. Accordingly, Council requests that *‘further consideration is given to the height, mass, scale, cluster and siting of the development...aimed at ensuring the development does not present a visual detracting on the scenic qualities of the southern end of the ranges.’*

Neoen makes the following comments:

#### 1. Neoen has discussed planning issues with Council

Neoen notes that it has been engaged with senior members of Council regarding CBEP for a period of over 18 months, and has presented multiple layouts to Council for review and comment. The last of these meetings was held on 10 November 2017, where Neoen presented a revised layout with all turbines north of the Wilkins Highway removed. Neoen’s position was that the RLP Zone did not specifically exclude wind turbines – this removal was not required by zoning, but was in deference to Council’s wishes to retain the area north of the Wilkins as a ‘visual/development buffer’ for the Flinders Ranges. The advice at that time from those members of Council (Mayor John Rohde, former CEO Andrew Johnson, and Chief Planner Grant Mackenzie) was that they were supportive of the new layout (noting that the full Council had not yet voted on it). Neoen summarised this point in an electronic letter shortly afterward and sent it to those Council attendees, inviting them to inform Neoen if their understanding of the meeting outcomes differed. No comments were received from Council. A copy of this letter is attached as **Appendix 2 (sent separately)**.

**Neoen notes that at no time has PDC 13 been raised by Council since Neoen began to engage with them regarding CBEP layouts.**

#### 2. The site does not possess unique scenic qualities

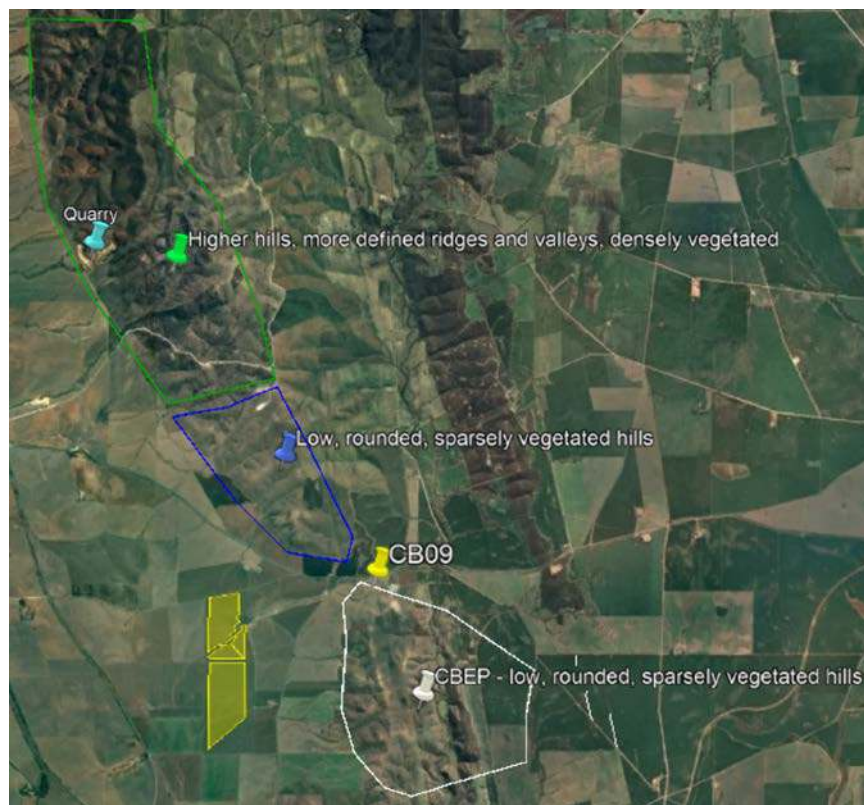
As stated in Chapter 1 (Issue 1 – Visual Impact), Neoen acknowledges the unique character and scenic qualities of the Flinders Ranges proper, and accepts the vital necessity to protect the Ranges from improper development. However, it does not accept that the landscape immediately north of Crystal Brook, which is characterised by cropland and low, rounded, sparsely vegetated hills, possesses these scenic qualities or character.



### 3. CBEP will not impair views of the Flinders Ranges

Neoen notes that this type of landscape (low, rounded hills with sparse vegetation) characterises both the Primary Production Zone on which the project is located, and the land for approximately 4km north-west of the northernmost turbine at CBEP (RLP Zone). At the end of this 4km, the hills begin to become more vegetated, with more pronounced ridges and valleys. The effect of this is that if CBEP is built, there will still continue to be a 4km visual buffer between the project and any landscape which can sensibly be considered the 'Flinders Ranges'. As discussed above, retaining this 4km stretch of hills as a 'visual/development buffer' from the Flinders is the rationale on which Council asked Neoen to remove the northern turbines from the project – a request to which Neoen agreed.

*Figure 15 – Landscape Types*



### 4. PDC 13 must be read subject to the Desired Character of the Zone

Notwithstanding the site's lack of unique scenic qualities, PDC 13 should also be read subject to the Desired Character of the Zone, which accepts that wind farm development is envisaged within valuable scenic and environmental areas. This is especially so given that PDC 13 provides no guidance on how development should avoid 'impairing natural views of the Flinders Ranges'. Neoen does not consider that smaller turbines would assist in fulfilling PDC 13.

## 2. Placement of turbines

The current CBEP layout has been developed by Neoen together with its expert consultants, WSP, who have decades of experience in building turbine layouts.

Spacing of turbines is not a trivial matter, and it is not possible to apply simple rules of thumb on a final turbine layout based on publicly available technical literature. However, Neoen would like to note the following:

1. Council has requested that the project be designed in a way which is 'efficient, coordinated and orderly', and has noted that under Renewable Energy Facilities PDC 2(a)(iii), turbines should be 'regularly spaced'. Neoen supports these objectives and considers that, having regard to the relatively omnidirectional wind directions at the CBEP site and the fact that the site does not, unlike some wind farms, comprise a single ridgeline, the spacing of the turbines at CBEP is regular, averaging separation distances of around 500m.
2. Council has stated that (1) CBEP's proposed use of larger turbines, (2) the scale of the proposed development and (3) the proposed placement of turbines closer together may have 'potential unknown effects' on noise. Neoen does not accept these claims. Specifically:
  - a. **Neoen does not accept the notion of 'clustering effects'**, which were also mentioned in several public submissions. Optimal placement of turbines on a 'whole of project' basis may result in a lower individual turbine yield due to increased wake losses (see further point 3 below), but neither Neoen nor its consultants (WSP and Sonus) are aware of any additional 'clustering' effect on noise emissions, or any academic or technical literature which supports such a claim. Cumulative noise emissions from turbines are well understood and well able to be modelled. Neoen requests that evidence be provided in support of this claim. Please see Issue 17 – Clustering Effects – in Chapter 1 of this Response for additional discussion of this point.
  - b. **Neoen does not accept that larger turbines have greater noise emissions.** Advancements in aerodynamics and mechanical technology, as well as the lower RPM associated with longer blades, mean that often, the opposite is true. Because sound power levels are proprietary information, Neoen is unable to disclose the sound power levels of the 4.8MW turbine model used for its noise modelling, but notes that it is significantly quieter than most of the 3.2-3.8MW machines which were under consideration when Neoen was developing Hornsdale. Please see Issue 4 – Noise – in Chapter 1 of this Response for additional discussion of this point.
  - c. **Irrespective of turbine size or a purported 'clustering effect', Neoen will be compelled to comply with regulatory noise guidelines, giving local residents protection from any hypothetical inaccuracies in modelling.** If Neoen's noise modelling is incorrect and noise at sensitive receivers exceeds regulatory guidelines, Neoen can be compelled by the EPA to 'de-rate' or shut down turbines to achieve compliance. However, this would be a very poor outcome for the project and there is therefore a clear motive for Neoen to ensure that the modelling is accurate.
3. Publicly available literature from manufacturers is intended as broad guidelines only – there are no hard limits for turbine spacing. Turbine layout is a highly technical field and requires a complex balance using sophisticated software between a range of factors such as prevailing wind directions, wake losses, overall energy yield and the economies of scale from building larger projects. For example, the optimal layout will often place turbines closer together, trading a slight increase in wake losses (and a lower per-turbine yield) in exchange for an overall higher energy yield across the project and a reduced price per turbine from the manufacturer (larger orders will result in lower prices). Provided that the resulting project complies with its Development Approval, this is a commercial decision for the proponent.

Because Neoen has not yet begun its turbine selection and procurement process (and as a matter of standard practice, does not do so on any of its projects until after Development Approval), the current layout is designed to preserve flexibility to utilise as wide a range of turbines as possible (within the limits of a Development Approval). This flexibility is vital to creating competitive tension between manufacturers and achieving the lowest possible cost of power for consumers.

4. Council has stated that ‘early indications show the development has the ability to negate(?) nuisances’, and for this reason requests that the ‘final layout and design be submitted prior to construction’, including temporary or minor constructions such as staff amenities, temporary construction facilities, workshops and laydown areas.

Neoen is unclear as to the intended effect of this request. The company is very happy to commit to (1) prompt, ongoing and detailed engagement and dialogue with Council regarding alterations to the project design from the current layout, and (2) submission of a final pre-construction layout to SCAP and Council for review to assure compliance with DA conditions – the company considers these to be standard practice. However, Neoen does not consider that it would be reasonable for Council to have additional powers to review any final layout on vague parameters of ‘nuisance’, ‘efficiency’ or ‘orderliness’. In the interests of commercial practicality and investment certainty, Neoen respectfully requests that any post-Approval conditions or powers of review be linked to firm conditions and measurable regulatory compliance.

5. Council has requested that a final Construction Environmental Management Plan (CEMP) be provided prior to construction, including *‘attenuation measures...aimed at ensuring relevant standards and guidelines are met (including manufacturer’s guidelines) and the development does not detrimentally impact the surrounding area or cause unreasonable interference through the emission of effluent, dust, airborne pollutants, noise, vibration, electrical interference, light spill, flickering, shadowing, reflection, glare, glint or other harmful nuisances’*.

As stated throughout the CBEP DA, Neoen is happy to commit to agreeing a satisfactory CEMP with Council and the Department of Planning prior to construction – this is standard practice. Neoen respectfully notes, however, as above, that it is not appropriate for Neoen’s compliance with ‘manufacturer’s guidelines’ (such as turbine spacing) to be subject to interpretation or approval by local government or planning authorities, as this is a highly technical area requiring specialist knowledge, and is, furthermore, a commercial matter. As above, therefore, Neoen requests that any CEMP required under an Approval condition be linked to avoidance and mitigation of actual impacts on the environment or residents – that is, to outcomes rather than the commercial means by which those outcomes are achieved.

### 3. Rural Landscape Protection Zone

#### a) Mistaken placement of turbine CB18 inside RLP Zone

Council has correctly pointed out that the original DA layout showed a proposed turbine location (CB18) approximately 100m inside the RLP Zone. This error arose due to Neoen's mistaken assumption that the RLP Zone ended at the Wilkins Highway rather than continuing south for some distance.

As Council notes, Neoen has now shifted this proposed location approximately 200m south, within the Primary Production Zone. Neoen apologises for this oversight and thanks Council and the Department of Planning for accepting the adjustment.

#### b) Transmission lines in the RLP

Council has noted PDC 9 of the RLP Zone stating that transmission lines should not be routed through the RLP Zone if a practical alternative exists. Neoen notes the following in response:

1. Because the proposed substation is located in the RLP Zone (due to the necessity of placing it adjacent to the existing 275kV Para to Bungama transmission line and the lack of other nearby locations along that line suited to achieving this), it is necessary for transmission lines to likewise be located in the RLP.
2. However, Neoen appreciates the planning objective of preserving the visual amenity of the RLP Zone, and consequently has committed in the DA to installing no more than 300m of overhead transmission line – a minimum length of overhead line is required to connect the substation to the existing 275kV line.<sup>26</sup>
3. All other transmission lines (from the turbines and solar panels to the substation itself) will be underground cable, and so will have no visual impact on the RLP Zone.
4. Because of the existing 275kV line adjacent to the proposed substation, it is not anticipated that a short additional length of overhead line will significantly impact on existing visual amenity.
5. Regarding the underground cable routes, there is also an existing above-ground gas pipeline in the RLP Zone along the Wilkins Highway, parallel to which the proposed underground transmission lines are proposed to run. Co-locating the transmission line with the gas pipeline will help to minimise construction impacts on the environment or on agriculture.

#### c) Revised map

Council has requested that a revised map of all infrastructure, including transmission lines, be provided. Neoen is happy to commit to providing such a map prior to construction once detailed project design is complete.

### 4. Traffic management and access

Council has:

1. Noted Neoen's commitment to agree a Traffic Management Plan (TMP) with local government and state transport authorities, and requested that this be made a condition, and
2. Requested a condition that Neoen enter into an agreement with Council regarding any road upgrades required by CBEP, and perform these upgrades at its cost.

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<sup>26</sup> Volume 1, p 20

Neoen agrees with these proposed conditions, adding only that (1) such road upgrades must be reasonably required, and (2) if Council requests road upgrades beyond those required for the project be performed at the same time Neoen is performing required upgrades (for example, to improve a road surface beyond the standard required for project vehicles), it is appropriate that Neoen be required to bear only those costs associated with upgrades required by the project.

## 5. Decommissioning

Council has requested that the submission of a satisfactory decommissioning and rehabilitation plan prior to construction should be made a pre-construction condition of any Development Approval.

Neoen agrees with this condition, which is standard practice.

Council has also requested that this plan include details of a 'suitable use for the site at end of life'. Neoen wishes to clarify that after decommissioning and rehabilitation, the site (which is privately owned freehold land) will continue to be suitable for the uses for which it is currently suitable, primarily being grazing and cropping (with the exception of any vegetation offsets which may have been acquired, which will of course continue to be protected in perpetuity as per the *Native Vegetation Act*).

## 6. Reception and service

Regarding potential impacts on radio, mobile and TV reception, Council has stated that:

1. Development should not jeopardise the continuance of authorised land uses;
2. Conducting pre- and post-construction surveys on electromagnetic interference and signal reception to identify and negate any potential impacts on the local community should be a condition of any Approval;
3. The acceptable level of impact to existing owners or occupiers should be nil; and
4. The recommendations set out in the EMI study in Volume 2 should be strengthened.

Neoen agrees with the proposed condition of pre- and post-construction surveys to quantify any impacts of the project on reception and service.

Neoen does not agree with the statement that the acceptable level of impact is 'nil'. CBEP is a technologically pioneering project which fulfill a variety of public policy objectives (the need for steady, dispatchable low cost power, grid stability services, emissions reductions, local investment and economic development) and weight should be given to these policy objectives in considering what impacts to reception and service are acceptable.

Neoen therefore suggests that it is reasonable for a 'minor' level of impacts to reception and service to be considered acceptable (noting that the EMI study does not consider impacts likely), on the condition that CBEP must use all practically available measures to avoid, mitigate or remedy such impacts, at CBEP's cost.

## 7. Wastewater

Council has requested that CBEP should be required to lodge a wastewater application with Council for the disposal of on-site effluent in accordance with the *South Australian Public Health Act 2011*.

Neoen agrees with this proposed condition.



## 8. Flora & fauna, offsets

Council has stated that ‘the potential and actual impacts of construction, operation and maintenance is unclear due to the indicative layout of construction’, and requested that the CEMP be required to ensure the protection, retention and restoration of natural resources and environment.

Neoen agrees with a condition that the CEMP should be required, and should aim for protection, retention and restoration of natural resources and the environment.

Neoen does not agree that the layout can be characterised as ‘indicative’ (acknowledging that further detail is required prior to construction), or that the environmental impacts of construction, operation or maintenance are unclear. The site has been thoroughly investigated by consultants EBS Ecology and Biosis, and environmental values on-site are well understood (subject to an additional spring follow-up survey).

Neoen also notes Council’s statement that restoration lands for revegetation are available and thanks the Council for this proposal – Neoen will be glad to continue this discussion following a decision by SCAP and engagement with DEW regarding native vegetation requirements.

## 9. Vegetation buffers around facilities

Council has noted that vegetation buffers around the solar facility, substation and ancillary structures are desirable, and has requested that Neoen be required to:

1. Provide a detailed landscape plan to the reasonable satisfaction of Council, including the location of all structures and proposed species; and
2. Take measures to ensure that vegetation is maintained and replaced as necessary.

Neoen agrees with these proposed conditions, on the proviso that any landscape plan must be consistent with requirements or requests from the CFS. Neoen notes the following excerpt from page 3 of the CFS comments on CBEP:

### VEGETATION MANAGEMENT:

- A vegetation management zone (VMZ) shall be established and maintained to 50 metres of each infrastructure enclosure as follows:
  - The number of trees and understorey plants within the VMZ shall be maintained such that when considered overall a maximum coverage of 30% is attained, and so that the leaf area of shrubs is not continuous.
  - No understorey vegetation shall be established within 10m of the fenced enclosures (Understorey is defined as plants and bushes up to 2m in height)
  - Grasses within the zone and throughout the site shall be reduced to a maximum height of 10cm during the fire danger season (eg by grazing, slashing or chemical treatment)
  - The VMZ shall be maintained to prevent the accumulation of dead vegetation during the fire danger season.

## 10. Property valuation

Council notes that at its June Ordinary Council Meeting, concerns were expressed as to potential downgrading in property valuation as a result of CBEP.

Neoen recognises that this is a common concern among some community members, and appreciates the importance of property values to households. However, Neoen does not consider that there is any evidence that appropriately sited wind turbines have a negative effect on these values. For additional discussion of this point, please see Issue 3, Chapter 1 – ‘Property Values’.

## Chapter 3 – Northern Areas Council

Neoen thanks the Northern Areas Council for its comments on the CBEP DA and proposes no amendments to the requested conditions. Neoen looks forward to engaging further with the Council regarding traffic management as the project progresses.

## Chapter 4 – Environmental Protection Agency

Neoen thanks the Environmental Protection Agency for its feedback on the CBEP Development Application.

Following consultation with its expert acoustic consultant, Sonus, Neoen notes that the EPA has suggested a number of conditions for CBEP which impose specifications on the project which are either unnecessarily prescriptive in terms of commercial parameters, or significantly more stringent than those set out in the EPA's Wind Farm Environmental Noise Guidelines (2009). They also represent an unequal application of the Guidelines to CBEP compared to previous projects.

Neoen therefore respectfully requests that SCAP and the EPA consider a number of amendments to the conditions proposed by the EPA, which shall result in equal (or improved) environmental outcomes while also granting CBEP greater flexibility to achieve those outcomes. Neoen notes that similar modifications were sought and granted for the Palmer Wind Farm and are being considered for Twin Creek Wind Farm. The modifications for the Palmer Wind Farm were also reinforced as suitable by the Environment Resources and Development Court in appeal proceedings.

These conditions and the proposed modifications are set out at length in **Appendix 3 (sent separately)** – a letter from Sonus to the EPA. The proposed modifications are as follows (heavily paraphrased – please see Appendix 3 for details):

### a) Condition A

This condition should be modified to achieve consistency with the EPA's *Wind Farms Environmental Noise Guidelines (2009)* (the EPA Guidelines), which require the “**greater of**” the baseline noise level (Condition a(a), (b) and (c)), or the background noise level plus 5 dB(A) (Condition a(d)) to be adopted as the criterion. ‘The greater of’ is currently omitted from the EPA's proposed condition.

### b) Condition 2

This condition restricts selected turbines to those which possess sound power levels no greater than those turbines used in the noise modelling.

Respectfully, this proposed condition is impractical, inappropriate and unnecessary. At the development application stage of the assessment, procurement and final selection of equipment has not occurred. The procurement process will be subject to a range of factors in the market place, including rapid technology advances and the timeframes associated with a major project. Due to these factors, the final form of the wind farm might be a smaller number of wind turbine generators located more centrally or spaced more widely within the wind farm, but with a higher sound power level than that considered in the March 2018 assessment. Alternatively, the sound power level at a given octave band might be higher but of limited consequence at a receiver.

That is, whilst the sound power levels might be higher than in the March 2018 assessment, there are many technical solutions which could result in equal or lower noise levels at dwellings. Such a positive environmental outcome would not be possible with the current wording of Condition 2.

Condition 2 currently places highly problematic market restrictions on the procurement of equipment without considering the environmental noise outcomes, and will substantially interfere with Neoen's ability to build CBEP by hindering it from running a competitive process. It will also prevent Neoen from ensuring the lowest possible cost of power from CBEP. Ultimately, the wind farm must comply with the EPA Guidelines at the dwellings, not with a sound power level.

Neoen also notes PDC 2 of the South Australia Wind Farm Development Guidelines: *The relevant planning should not try to lock the wind farm developer into using a particular brand of turbine as this action may have the effect of preventing the adoption of improved technology. Considering the length of time that often transpires between the lodgement of an application and the actual installation of the turbines, a more advanced turbine model may be available.*<sup>27</sup>

c) Condition 3

Current EPA Condition

Noise emissions of the wind turbine generators (WTGs) intended for installation must not include tones audible at the noise receivers ( $\#L_{a,k} > O$ ). The tonality test procedure is defined in *IEC 61400-11, Ed.3.0: Wind turbines - Part 11: Acoustic noise measurement techniques*. In the case where the proponent cannot submit technical information confirming this, absence of tones audible at the noise sensitive receivers must be confirmed by the results of a post-construction acoustic test performed at locality H15 as shown in the acoustic report *Crystal Brook Energy Park Environmental Noise Assessment, March 2018, Document ref.: S5089C6*, prepared by Sonus Pty Ltd.

Proposed Modification

Noise emission of WTGs intended for installation must not include audible tones at the noise receivers when tested in accordance with a methodology approved by the EPA based on a tonality test procedure as defined in *IEC 61400-11, Ed.3.0: Wind turbines - Part 11: Acoustic noise measurement techniques*. prior to the commencement of construction.

Rationale

The IEC Standard referenced in Condition 3 requires:

1. the removal of background noise from the test results;
2. the test to be conducted close to a turbine (not at a dwelling);
3. the presence of tonality to be based on a very short period of time (minutes worth of data);
4. the tests to be conducted over a range which does not include all operational wind speeds;
5. downwind testing, which might not represent the condition under which audible tones are generated.

In contrast, a tonality test methodology for a wind farm needs to:

1. include background noise to account for its influence in the subjective response to a noise source;
2. be conducted at a dwelling;
3. consider the presence of tonality in all 10 minute data points; and
4. include all operational wind speeds and directions.

Therefore, a direct reference to the IEC Standard without a complementary test methodology which overcomes its deficiencies and inconsistencies presents significant risks to a wind farm project without providing a guarantee of the desired environmental outcomes. A detailed methodology based on the IEC Standard with specific inclusions to offset the deficiencies of that standard can be prepared.

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<sup>27</sup> <https://www.lga.sa.gov.au/webdata/resources/files/2012.32%20-%20Windfarm%20Development%20Guidelines%20-%20Final%20Report.pdf> p 10



d) Condition 4

Current EPA Condition

Rated sound power of the **substation's transformer** must not exceed the levels indicated in Table 4 in the acoustic report *Crystal Brook Energy Park Environmental Noise Assessment, March 2018*, Document ref.: S5089C6, prepared by Sonus Pty Ltd.

Proposed Modification

The final pre-construction noise assessment prepared for submission to the EPA must include the final selection for the substation's transformers, the transformer sound power levels, and predictions of the noise for comparison against the relevant criteria.

Rationale

Please refer to Condition 2 commentary – this condition places market restrictions on equipment selection which are not warranted by environmental outcomes.

Furthermore, the predicted noise from the solar, battery and substation is significantly less than the relevant criteria. Therefore, the sound power levels locked in by the condition could be significantly increased without having any adverse impacts on the environs or breaching the criteria. It is not reasonable for the generally applicable criteria to be altered in relation to CBEP.

e) Condition 5

Current EPA Condition

Sound power of the **solar inverters and battery site inverters** must not exceed the levels indicated in Table 1 in the acoustic report *Crystal Brook Energy Park Environmental Noise Assessment, March 2018*, Document ref.: S5089C6, prepared by Sonus Pty Ltd

Proposed Modification

The final pre-construction noise assessment prepared for submission to the EPA must include the final selection for the solar inverters and battery site inverters, the inverter sound power levels, and predictions of the noise for comparison against the relevant criteria.

Rationale

Please refer to Condition 2, 3 and 4 commentary – this condition places market restrictions on equipment selection which are not warranted by environmental outcomes.

f) Condition 6

Current EPA Condition

Sound power of **electric transformers** at the solar power site must not exceed levels indicated in Table 2 in the acoustic report *Crystal Brook Energy Park Environmental Noise Assessment', March 2018*, Document ref.: S5089C6, prepared by Sonus Pty Ltd.

Proposed Modification

The final pre-construction noise assessment prepared for submission to the EPA must include the final selection for the electric transformers at the solar power site, the transformer sound power levels, and predictions of the noise for comparison against the relevant criteria.

Rationale

Please refer to Condition 2, 3, 4 and 5 commentary – this condition places market restrictions on equipment selection which are not warranted by environmental outcomes.

g) Condition 7

Current EPA Condition

Sound power of cooling/air conditioning units installed on the battery site must not exceed levels indicated in Table 3 in the acoustic report *Crystal Brook Energy Park Environmental Noise Assessment, March 2018, Document ref.: S5089C6*, prepared by Sonus Pty Ltd.

Proposed Modification

The final pre-construction noise assessment prepared for submission to the EPA must include the final selection for the cooling/air conditioning units installed on the battery site, the cooling/air conditioning unit sound power levels, and predictions of the noise for comparison against the relevant criteria.

Rationale

Please refer to Condition 2, 3, 4, 5 and 6 commentary – this condition places market restrictions on equipment selection which are not warranted by environmental outcomes.

h) Condition 8

This proposed condition requires that:

1. Neoen must appoint an independent acoustical consultancy other than the company which prepared the March 2018 assessment (Sonus) to monitor post-construction noise levels; and
2. Post-construction noise monitoring must be carried out at dwellings H13, H15, H16, H17 and H51, and submitted to the EPA within 3 months of wind farm commissioning.

Neoen makes the following comments in response:

1. Neoen appreciates that the EPA is seeking to ensure that the project's noise modelling is not susceptible to accusations of lack of independence by opponents. However, Neoen respectfully suggests that the proposed condition does not represent the correct approach to achieve this. Prohibiting Neoen from selecting Sonus as its acoustic consultant is liable to be interpreted as casting aspersions on both the independence of Sonus and the ethical conduct of Neoen. It will also encourage opponents of renewable developments to continue employing the tactic of making baseless accusations regarding consultants' independence. Neoen notes that some project neighbours have expressed to Neoen a refusal to accept noise modelling results at CBEP unless noise monitoring is (1) performed by Mr Steven Cooper, an acoustician with a well-publicised stance against wind energy and strong links to the Waubra Foundation, and (2) offered to residents of every dwelling within a radius of 10km of CBEP (that is to say, thousands of homes).

In the absence of any valid substantive criticism of Sonus' methods or any evidence of inappropriate conduct or incompetence, Neoen considers that it is not appropriate to place market restrictions on the selection of an acoustic consultant – this should be a commercial decision for Neoen to make.

2. While Neoen of course agrees with the condition of conducting post-construction noise monitoring, neither it nor Sonus consider that three months is a practical time-frame to generate, process and submit six weeks of monitoring data, especially in the period following commissioning. During this period, it is typical that various defects and issues with the project will need to be remedied by the EPC contractor, as a result of which construction traffic and noise may be elevated above average levels. Most importantly, turbines are likely to be turned on and off during this period, making it impossible to comply with the Guidelines which require that all turbines be in operating mode during the testing period. Neoen respectfully proposes that 8 months after commissioning would be a more appropriate schedule.
3. Of the dwellings selected:
  - a. **H13** is near-derelect and slated for demolition by its owner (who occupies H12 – please note the letter to this effect attached to Volume 2 of the DA) and is not an appropriate location to conduct noise monitoring since it will cease to be a dwelling;
  - b. Neoen agrees that **H15** and **H16** are appropriate locations for noise monitoring;
  - c. Neoen previously contacted the owner of **H17** for permission to conduct noise monitoring, and was refused permission unless certain deeply onerous conditions were met, including:
    - i. (1) monitoring to be performed by Mr Steven Cooper, and
    - ii. (2) monitoring to be offered to residents of every dwelling in a 10km radius around CBEP (that is, thousands of homes).Neoen is happy to make an additional request but cannot guarantee that permission will be given.
  - d. Neoen agrees that **H51** is an appropriate location for noise monitoring, noting that pre-construction noise monitoring has not been conducted.

## Chapter 5 – Country Fire Service

Neoen thanks the CFS for its comments on the CBEP DA and proposes no amendments to the CFS' requested conditions. Neoen looks forward to engaging further with the CFS regarding fire risk management as the project progresses.

## Chapter 6 – Department for Environment and Water

Neoen thanks the DEW for its comments on the CBEP DA, and makes the following comments:

1. Neoen agrees with DEW's concern that native orchids may not have been visible during EBS' summer and autumn visits. EBS also agreed with this and recommended conduct of follow-up pre-construction spring surveys in relevant areas. Consequently, Neoen engaged EBS to perform a spring field survey in late September 2018. **No orchids were found** (please see **Appendix 1 (sent separately)** for a copy of this report).

Consequently, Neoen respectfully proposes that a condition of conducting 'annual surveys as part of ongoing monitoring requirements' is not appropriate at this time as these species do not appear to be present on site. Nevertheless, Neoen proposes that a condition be made as follows:

- a) If, despite the results of the EBS survey, orchids are found on-site at any time before or during construction, then 2-3 annual follow-up surveys must be undertaken after construction is complete for impact monitoring purposes;
- b) If these annual follow-up surveys indicate that there is no substantial impact, additional surveys should be at 5-yearly rather than annual intervals.

Neoen also proposes that if orchids are found before or during construction, it be a condition that Neoen must take the following mitigation actions, as necessary, in consultation with EBS:

- a) fencing off orchids to protect them from grazing (to which they are already subject);
  - b) micro-siting turbines to avoid the orchids; or
  - c) where micro-siting is not possible, translocating orchids to suitable new locations.
2. After reviewing DEW's comments, EBS has advised Neoen that there is unlikely to be any requirement to undertake further studies as to whether the *Eucalyptus odorata* areas qualify under the EPBC Act, as they are not located within the project area. EBS also considers (noting that it has not undertaken a rigorous assessment of the areas against EPBC benchmarks at an ideal period) that there is 'almost zero' chance of either of the patches in question qualifying under the Act. Neoen therefore proposes that this condition not be included in a DA.
  3. Neoen agrees with DEW's proposal to conduct collision modelling of Wedge-Tailed Eagles.
  4. Neoen is happy to collaborate with DEW on the collection and storage of seeds of significant/threatened plant species.



## Chapter 7 – Department of Planning, Transport and Infrastructure

Neoen thanks the Department for its comments on the CBEP DA and makes the following comments on its proposed conditions:

1. **Access:** Noting previous discussion of access in Chapter 1, Issue 11 (Traffic), Neoen agrees with DPTI that the Wilkins Highway does not appear to comprise a suitable access point at this time.

DPTI has instead proposed a condition locking in access to the site via Hughes Gap Road or abutting roads.

Neoen would strongly prefer that access remain open to discussion to give Neoen time to evaluate and plan potential access arrangements in detail. In particular, Neoen notes that access via DPTI's proposed Hughes Gap Road route will require further planning and potential agreements with other landholders to ensure that vehicles are able to enter Hughes Gap Road via a route **other** than Crystal Brook township, as routing heavy vehicle construction traffic close to the town would be highly disturbing for residents and potentially unsafe for local road users.

Neoen also respectfully proposes that Condition 1 is not necessary given that per Condition 2/3, Neoen's TMP must define access points to the site (with the TMP being subject to Council and DPTI approval). Consequently, Neoen requests that Condition 1 not be imposed.

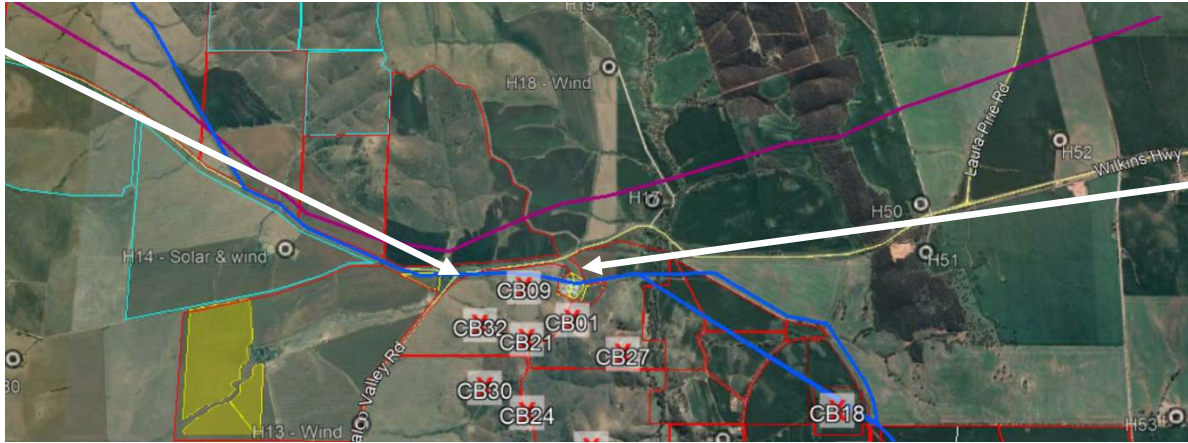
2. **TMP:** Neoen agrees with the proposed condition.
4. **Reinstatement of infrastructure:** Neoen agrees with the proposed condition.
5. **Review of potential distraction on eastbound Wilkins Highway route:** DPTI has indicated that it considers there is potential for distraction of drivers travelling eastbound along the Wilkins Highway on approach to the Hughes Gap/Wilkins intersection due to the 'appearance of a turbine directly in front of a driver as they negotiate reverse and incline curves at this location', and has requested that a photomontage be prepared prior to full approval being granted.

Neoen considers that safety for road users is paramount. However, it respectfully disagrees that there is any significant potential for distraction along this stretch of road due to sudden appearance of turbines in front of drivers, on two grounds:

- a) The closest turbine (CB09) is set back approximately 230m from the road, on ground which rises to approximately 20m above eye level of drivers. For turbines of the size proposed at CBEP, blade sweep begins at least 60 metres above the ground. Consequently, drivers rounding a corner are unlikely to see moving turbine blades, but will instead primarily see a static, matte white tower which, Neoen suggests, is no more visually distracting than any other roadside objects such as billboards, signs and trees. Neoen would also be happy to consider painting the lower sections of these closest towers a different colour to reduce immediate visual impact, if consistent with other DA conditions and planning regulations.
- b) All of the turbines are located on high ground and, as tall structures, will be clearly visible to drivers for several kilometres of long, straight approach road (see Figure 14). Given the length of this approach, drivers are likely to expect to see turbines when rounding corners.

Figure 15 is a photo taken on the Wilkins Highway, approximately halfway toward the Princes Highway and facing the project. While it is not a photomontage with turbines included, it demonstrates the clear visibility that drivers will have of the project while travelling on the Wilkins Highway, and the resulting gradual approach to the turbines.

*Figure 16 – Long-distance sight lines on Wilkins approaches*



*Figure 17 – Approximate location of CB09*

6. **Stormwater:** Neoen agrees with the proposed condition.