NSW GOVERNMENT | Office of Environment & Heritage

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Mr Matthew Todd-Jones
NSW Planning Assessment Commission

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Dear Mr Todd-Jones

Bango Wind Farm

Thank for you for notifying the Office of Environment and Heritage (OEH) of the Planning Assessment Commission's upcoming determination of the Bango Wind Farm application. OEH provides the following comments on the proposal:

Biodiversity

OEH does not have confidence in the accuracy of the vegetation mapping and therefore the offset requirements as presented in Table 12 of the Assessment Report. OEH understands that the estimates of clearing are based on the proponent's worst-case scenario. Nevertheless, given the limited vegetation mapping, it is not possible to determine whether or not the proposed offset is valid or whether, in association with the proposed conditions, it will improve or maintain the biodiversity values of the locality.

OEH is concerned about the high bird and bat collision risk from turbines in the following situations:

- Within 500m of Wedge-tailed Eagle nests,
- Within 100m of hollow-bearing trees, particularly as this site contains core breeding habitat for the Commonwealth-listed endangered Superb Parrot, and
- Within and along edges of intact woodland and forest patches, where bird and bat activity levels are high.

The most effective way to manage impacts to birds and bats from operating turbines is through avoiding high risk locations for turbines. **Attachment 1** contains a table of OEH's recommendations for avoiding impacts to birds and bats for each turbine in both proposed layouts of the Bango Wind Farm.

Proximity to Wedge-tailed Eagle nests

Wedge-tailed Eagles are long-lived and may mate for life. Established breeding pairs are territorial and fiercely defend their nest sites. In the carcass data from wind farms in south-east NSW, compiled by OEH, Wedge-tailed Eagles are disproportionately represented, given how large their territories are

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(and their low density in the landscape) compared to other species. The majority of Wedge-tailed Eagle strikes occur within 1km of remnant vegetation patches (Brett Lane pers. comm.).

OEH recommends a buffer of 500m around Wedge-tailed Eagle nests because the eagles are at greatest risk when young and first flying. They also appear to be at high risk when sub-adults are dispersing from their natal territories, but this is impossible to buffer. Courtship displays and territorial defence behaviour may result in blade-strike, and these are anecdotally more likely to happen around nest sites.

Eight turbines in layout 1 and five turbines in layout 2 are within 500m of Wedge-tailed Eagle nests.

The loss of raptors is a major concern ecologically, as these species regulate the food chain and maintain a stable equilibrium in nature. Predator-prey relationships can be complex, and removing a top predator can alter the balance of an entire ecosystem. In this case it could lead to a boom in small pest populations, e.g. rabbits, which would in turn lead to further degradation of the environment. The other concern is that cumulative impacts of numerous wind farms in a region could lead to this species becoming regionally threatened.

Superb Parrot habitat and hollow-bearing trees

Hollow-bearing trees within Box-Gum Woodland provide essential nesting habitat for Superb Parrots. OEH acknowledges that the removal of the Langs Creek cluster reduces the potential impacts on this species. According to the maps provided in the Biodiversity Response to Submissions, there are numerous hollow-bearing trees within Box-Gum Woodland in the current development footprint or located within the high-risk areas adjacent to turbines.

OEH recommends a distance of at least 50m from the blade tip to the canopy of hollow-bearing trees to reduce the blade-strike risk to birds and bats. Direct distance between the tree and turbine will vary, depending on the height of the tower, length of the blade and height of the tree, however it is likely to be between 75m and 100m. At least ten turbines in layout 1 and seven turbines in layout 2 appear to be within that distance of hollow-bearing trees.

There has been a dramatic decline in the number of hollow-bearing trees in this region, and the formation of hollows in Box-Gum Woodland takes a very long time (100-200 years). Slowing the decline in available hollows is critical, through protecting the existing hollow-bearing trees and restoring habitat. OEH recommends that all hollow-bearing trees in the development footprint be assessed during Superb Parrot breeding season (from September to January). If an active Superb Parrot nest hollow is found, the tree cannot be cleared.

The use of artificial nest boxes is not an effective long-term mitigation method for the loss of hollow-bearing trees, particularly for Superb Parrots. Natural hollows persist in the environment for decades if not centuries. To be truly effective artificial nest boxes would require regular maintenance over this same period. This is not realistic given that wind farms only have expected operating period of approximately 25 years. OEH recommends that if any hollow-bearing trees are to be removed or impacted, they must be offset by protecting and enhancing other vegetation with similar density of hollow-bearing trees. Potential nesting habitat should not be cleared during the breeding season to ensure that nest Superb Parrots and their young are not killed.

Fragmentation and alienation of habitat

Operating wind turbines present a greater risk to birds and bats when located in or adjacent to woodland or forest. Impacts can include alienation of habitat for woodland species, and direct blade-strike by species that use the woodland and fly at rotor-swept area height. OEH generally recommends that wind farm layout and design can avoid certain biodiversity impacts by setting turbines back from woodland edges by at least 100m. This setback distance may be achieved through micro-siting.

Clearing (or alienation) of remnant, linear, roadside Box-Gum Woodland vegetation has the potential to have a significant impact on Superb Parrots. These remnants contain essential breeding habitat in rural landscapes. The linear connectivity values of roadside vegetation in this area are irreplaceable

so OEH recommends that road works, cabling trenches and infrastructure easements be located away from remnant vegetation wherever possible.

It should also be noted that the Box-Gum Woodland Endangered Ecological Community (EEC) is itself of high conservation value and it highly endangered with less than 5% of its original extent remaining in this region. Remnants are now severely fragmented and/or degraded due to their disturbance history, and some remnants survive as derived grassland or scattered paddock trees. Threats include: further clearing (for cropping, pasture improvement or other development); deterioration of remnant condition (caused by firewood cutting, increased livestock grazing, weed invasion, inappropriate fire regimes, soil disturbance and increased nutrient loads); degradation of the landscape in which remnants occur (including soil acidification, salinity, and loss of connectivity between remnants). OEH recommends that all moderate to good condition Box-Gum Woodland EEC should be retained.

Aboriginal cultural heritage

Changes to the development footprint may require additional Aboriginal cultural heritage survey and assessment. Additional archaeological survey and assessment must occur at any areas included in the development footprint, through detailed design and micro-siting, that have not previously been surveyed or assessed. Consideration should also be given to ensuring surface salvage is undertaken if agreed to by the Registered Aboriginal Parties.

If you have any queries regarding the issues raised in this letter please do not hesitate to email us at rog.southeast@environment.nsw.gov.au or by telephoning the contact officer listed below.

Yours sincerely

21.03.2018

MICHAEL SAXON
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Regional Operations Division

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ATTACHMENT 1 – OEH recommendations to reduce bird and bat collision risk

Layout 1 turbine no.	Layout 2 turbine no.	Suggested action to reduce risk	Constraint
1	7	Microsite away from constraints	Adjacent to woodland edge – increased risk of blade-strike and alienation of habitat
2	9	Microsite away from constraints	Surrounded by hollow-bearing trees, likely to be within 50m of blade-tip
5	No equivalent	Microsite away from constraints	Surrounded by hollow-bearing trees, likely to be within 50m of blade-tip
7	31	Delete	In the middle of woodland - high risk of blade strike and habitat fragmentation
11	39	Microsite away from constraints	In small patch of box gum woodland
14	45	Delete	Within 300m of wedge-tailed eagle nest 2 and surrounded by constraints – very high risk of blade strike
17	No equivalent	Microsite away from constraints	Adjacent to box gum woodland EEC patch – increased risk of blade-strike and alienation of habitat as EEC patch surrounded by turbines
18	No equivalent	Microsite away from constraints	Adjacent to box gum woodland EEC linear strip – increased risk of blade-strike and other impacts on species dependent on remnant EEC
22	No equivalent	Microsite away from constraints	Within woodland – increased risk of blade-strike and alienation of habitat
24	93	Microsite away from constraints	Adjacent to woodland edge – increased risk of blade-strike and alienation of habitat
25	103	Delete	Within 400m of wedge-tailed eagle nest 5 – very high risk of blade strike (or microsite away from all constraints)
26	92	Delete	Within intact forest - high risk of blade strike and habitat fragmentation
27	No equivalent	Delete	Within 250m of wedge-tailed eagle nest 2 – very high risk of blade strike
28	No equivalent	Microsite away from constraints	Within forest patch – increased risk of blade strike
32	No equivalent	Microsite away from constraints	Adjacent to box gum woodland EEC patch – increased risk of blade-strike and alienation of habitat as EEC patch surrounded by turbines
33	No equivalent	Microsite away from constraints	Surrounded by hollow-bearing trees
35	59	Microsite away from constraints	Within box gum woodland - increased risk of blade-strike and alienation of habitat
36	No equivalent	Microsite away from constraints	Close to box-gum woodland and hollow-bearing trees – risk of blade-strike or habitat alienation

Layout 1 turbine no.	Layout 2 turbine no.	Suggested action to reduce risk	Constraint
47	54	Delete	Within intact forest - high risk of blade strike, alienation or habitat fragmentation
48	64	Delete	Within 300m of wedge-tailed eagle nest 4 – very high risk of blade strike
50	50	Microsite away from constraints	Adjacent to small patch of box gum woodland - high risk of blade strike or alienation
54	2	Delete	Within intact forest - high risk of blade strike, alienation or habitat fragmentation
57	6	Microsite away from constraints	Adjacent to intact forest - high risk of blade strike or alienation
58	5	Delete	Within intact forest - high risk of blade strike, alienation or habitat fragmentation
61	19	Microsite away from constraints	Adjacent to box gum woodland EEC patch – increased risk of blade-strike and alienation of habitat as EEC patch surrounded by turbines
62	No equivalent	Delete	Surrounded by hollow-bearing trees, intact woodland, and between two wedge-tailed eagle nests 1 and 5 – high risk of blade strike
76	22	Delete	Within 400m of wedge-tailed eagle nest 3 – very high risk of blade strike (or microsite away from all constraints)
80	8	Delete	Surrounded by hollow-bearing trees, likely to be within 50m of blade-tip
81	10	Delete	At location of wedge-tailed eagle nest 4 – very high risk of blade strike
83	No equivalent	Delete	Within 300m of wedge-tailed eagle nest 4 – very high risk of blade strike
86	56	Microsite away from constraints	Adjacent to small patch of box gum woodland - high risk of blade strike or alienation
88	57	Microsite away from constraints	Adjacent to intact forest - high risk of blade strike or alienation
95	No equivalent	Microsite away from constraints	Within small patch of forest – risk of blade-strike or alienation
97	83	Microsite away from constraints	Close to hollow-bearing trees – within 50m of blade-tip
98	No equivalent	Delete	Within 500m of wedge-tailed eagle nest 3 – very high risk of blade strike (or microsite away from all constraints)
100	32	Microsite away from constraints	Move away from forest edge
111	No equivalent	Microsite away from constraints	Surrounding risks include wedge-tailed eagle nests, hollow-bearing trees, box-gum woodland and forest, and dam
115	87	Microsite away from constraints	Close to hollow-bearing trees – within 50m of blade-tip

Layout 1 turbine no.	Layout 2 turbine no.	Suggested action to reduce risk	Constraint
122	16	Delete	Surrounded by hollow-bearing trees, likely to be within 50m of blade-tip
No equivalent	13	Microsite away from constraints	Close to hollow-bearing trees – within 50m of blade-tip
No equivalent	44	Delete	Surrounded by hollow-bearing trees, intact woodland, and between two wedge-tailed eagle nests 1 and 5 – high risk of blade strike
No equivalent	52	Microsite away from constraints	Close to box-gum woodland and hollow-bearing trees – risk of blade-strike or habitat alienation