



Office of
Environment
& Heritage

Our Ref: DOC18/74075
Your Ref: MP10_160 – Stage 2 MOD 6

Ms Phillipa Duncan
Resource and Energy Assessments, Planning Services
Department of Planning and Environment
GPO Box 39
Sydney NSW 2001

Attention: Mr Tim Stuckey, Environmental Assessment Officer

Dear Ms Duncan

Re: White Rock Wind Farm project - Modification Proposal MP10_0160 MOD 6

Further to my letter dated 15 March 2018 on this matter the Office of Environment and Heritage (OEH) provides the following updated response, which supersedes that letter.

Thank you for your email dated 6 February 2018 about a further modification to the White Rock Wind Farm project (MP10_0160) seeking comments from the OEH. I appreciate the opportunity to provide input.

We have reviewed the documents supporting the proposed modification including the Biodiversity Assessment Report (BAR), Biodiversity Offset Package (BOP), Bird and Bat Impact Assessment (B&BIA) and Aboriginal Cultural Heritage Assessment (ACHA). Detailed OEH comments are provided in **Attachment 1** to this letter.

Our review of the BAR and associated mapping as submitted via the Biobanking assessment methodology (BBAM) tool indicates that, overall, the vegetation mapping adequately captures the extent and condition of endangered ecological communities (EECs) in accordance with the OEH advice provided to the proponent's ecological consultants. The OEH also supports the recommendations provided in the BOP and ACHA. However, there are some aspects of the BAR and B&BIA that require further clarification and these should be addressed.

In summary, the OEH recommends that:

1. Prior to determination of the application:

- a. The assessment undertaken under the Framework for Biodiversity Assessment (FBA) should be amended to consider the black-throated finch, Boorolong frog, pale-headed snake and *Callistemon pungens* as species credit species according to habitat features present across the site (as per 6.5.1.7 in the FBA).

- b. The Biodiversity Assessment Report should be amended to include information on:
 - i. The location of assessment circles (3.2.1.3);
 - ii. All rivers and streams that occur within the development site and outer assessment circle including stream order classifications (4.1.1.9);
 - iii. The extent of native vegetation (5.1.1.1).
 - c. Additional bird and bat surveys should be undertaken, particularly in the new turbine location areas, to further inform the Bird and Bat Impact Assessment and subsequent Bird and Bat Adaptive Management Plan for Stage 2.
 - d. An assessment should be undertaken of alterations to bird and bat movement patterns/flights paths resulting from the new turbine locations including demonstrating how the project has been sited to avoid and/or minimise such impacts.
 - e. An assessment of the roosting and nesting sites for aerial species (including the Wedge-tailed Eagle) should be undertaken including an assessment of distances of nests from turbines and associated impacts and demonstrating how the project has been sited to avoid and/or minimise such impacts.
 - f. The Bird and Bat Impact Assessment should further consider the impacts on birds and bats from blade strikes, low air pressure zones at the blade tips (barotrauma, including the potential nature/extent of impacts, significance of such impacts on threatened species and mitigation measures). This should include consideration of only using the GW140 turbine models to reduce potential impacts on birds and bats by maximising the rotor ground clearance.
2. Following determination of the application:
- a. The OEH should be given an opportunity to review the draft Flora and Fauna Management Plan (FFMP), Bird and Bat Adaptive Management Plan and other relevant draft post approval documents that address mitigation measures for the Stage 2 development and provide comment on the adequacy of proposed mitigation measures.
 - b. The risks to threatened bat species should be reassessed once data has been collated from the two-year monitoring phase for the Stage 1 project, and this re-assessment should be used to inform the Bird and Bat Adaptive Management Plan for Stage 2.
 - c. Recommendation 11 of the ACHA concerning an on-site meeting with the registered Aboriginal parties to discuss heritage management issues and the ongoing development of the project should be implemented.

If you have any further questions about this issue, Ms Rachel Lonie, Senior Conservation Planning Officer, Regional Operations, OEH, can be contacted on 6650 7130 or at rachel.lonie@environment.nsw.gov.au.

Yours sincerely

 22 March 2018

DIMITRI YOUNG
Senior Team Leader Planning, North East Branch
Regional Operations

Contact officer: RACHEL LONIE
 6650 7130

Attachment 1: Detailed OEH Comments – Modification to the White Rock Wind Farm project (MP10_0160 MOD 6)

1.0 Overall Impacts of the Modification Application

The Office of Environment and Heritage (OEH) has been requested to provide comment on the proposed modification to the White Rock Wind Farm project (MP10_0160 MOD 6). The application has been made under section 75W of the *Environmental Planning and Assessment Act 1979* (EP&A Act) (now repealed). As the application was submitted on 24/01/2018 it was within the “two-month window” following the passage of the EP&A Amendment Bill.

As this is a transitional Part 3A Project no SEARs have been issued by the Department of Environment and Planning (DPE). However, the OEH provided previous advice to the proponent’s ecological consultants on request in November and December 2016 about the biodiversity and landscape assessment approach for the proposal and the mapping of endangered ecological communities as referenced in the Biodiversity Assessment Report.

The current project approval covers a total of 119 turbines (49 turbines in the Stage 2 development) and the proposed modification for the White Rock Wind Farm (WRWF) involves:

- reducing the overall number of Stage 2 turbines from 49 to 48;
- relocation of 20 of the 48 Stage 2 turbines and minor changes to nine of the Stage 2 turbines
- increasing Stage 2 turbine dimensions including:
 - a maximum tip height of up to approximately 200 m
 - larger turbine rotor blades of up to approximately 85 m in length
 - a distance of between 30 – 59 metres above ground level to the blade tip
 - hub heights of up to approximately 130 m
- increasing the overall project area to 15,078 ha to remove one and include four additional properties
- additional access tracks for relocated turbine sites and additional temporary construction facilities including construction compounds, laydown areas and rock crushing and concrete batching plants
- increasing the approved native vegetation clearing limit from 28 ha to 90 ha to enable the Stage 2 development (i.e. additional clearing of 62 ha of native vegetation).

A significant change to the current consent is to seek approval to use different turbine models for Stage 2. Features of the different models under consideration are summarised below:

Table 1. Turbine dimensions for Stage 1 and potential Stage 2 Turbine models

Wind Turbine Parameter	GW121 – 2.5MW (Stage 1)	GW140 – 3.0-3.5MW (Stage 2)	GW170 Indicative (Stage 2)
Max Tip Height (approx.)	150 m	200 m	200 m
Max Hub Height (approx.)	89.5 m	130 m	115 m
Rotor diameter (approx.)	121 m	140 m	170 m
Clearance below rotor to ground level (approx.)	29 m	59 m	30 m

Although the number of turbines has not increased, the area of operation has been considerably expanded eastward and westward. In addition, the native vegetation clearing due to the new turbine locations, associated infrastructure and engineering details is over 220% greater than was originally approved. The increase is reportedly due to the original impact calculations under-estimating the impacts of tracks with the associated cut and fill and batter structures on steep slopes.



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- additional access tracks for relocated turbine sites and additional temporary construction facilities including construction compounds, laydown areas and rock crushing and concrete batching plants
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Clearance below rotor to ground level (approx.)	29 m	59 m	30 m

For the purposes of the assessment undertaken by the proponent, a Goldwind turbine model GW140 has been used as an indicative and suitable turbine model. However, an alternative turbine model GW170, with greater blade lengths and lower clearance to the ground level, is also considered. As described in Table 1 above, the increase in rotor diameter for the GW140 model is approximately 16.5 % greater than the model approved for Stage 1, whilst for the GW170 model it is approximately 40% greater than the model approved for Stage 1. Although this modification involves reducing the number of approved turbines by one, the longer blade lengths is likely to result in a greater impact on birds and bats as discussed below.

Comparison of the original Wind Farm layout and the proposed modification reveals a large change in development footprint, as set out in the map below, which shows the new locations for Stage 2 turbines (red dots) and tracks (connecting yellow lines). Turbines 121 through to 130 are in new locations in the western area of the subject site, as are Turbines 132, 133, 134, 135, 136, 137 in the eastern part of the site and Turbines 120, 138 and 139 in the south.

Although the number of turbines has not increased, the area of operation has been considerably expanded eastward and westward. In addition, the native vegetation clearing due to the new turbine locations, associated infrastructure and engineering details is over 220% greater than was originally approved. The increase is reportedly due to the original impact calculations under-estimating the impacts of tracks with the associated cut and fill and batter structures on steep slopes.

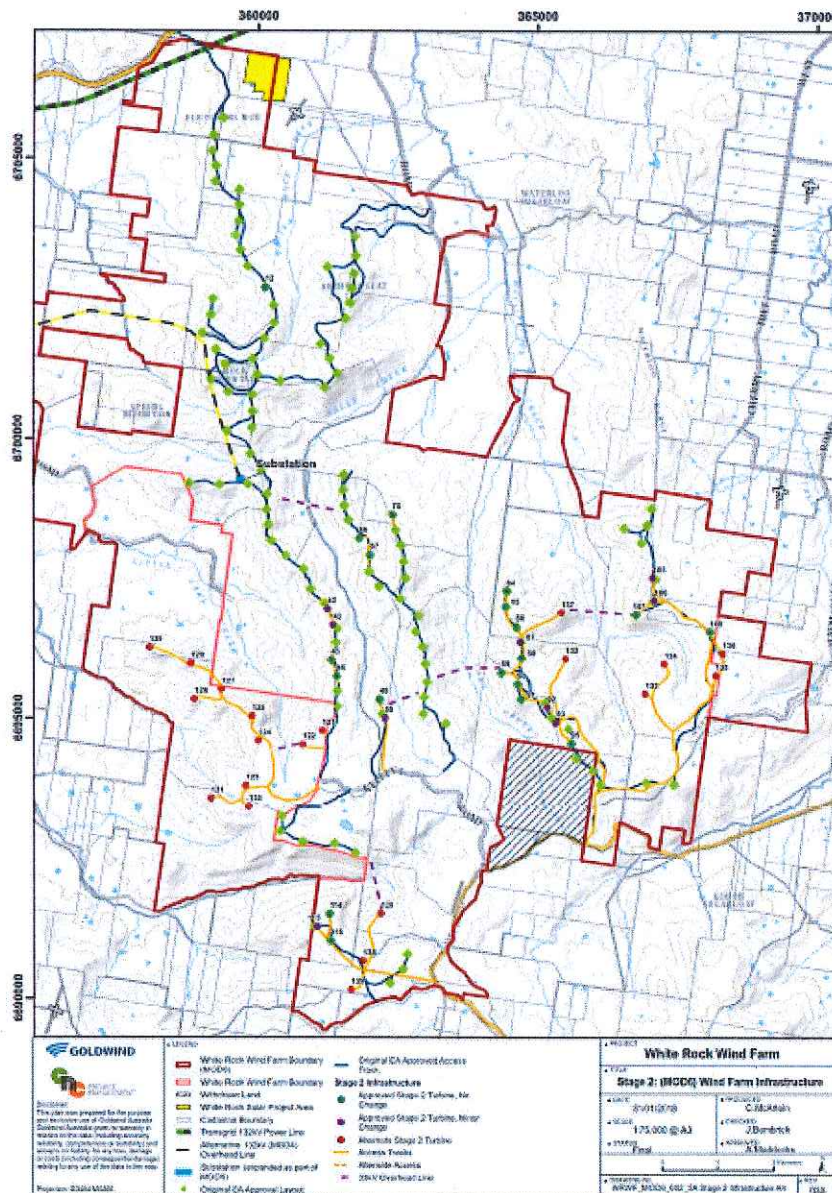


Figure 2.1 WRWF Indicative Stage 2 layout

2.0 Biodiversity

2.1 Assessment under the Framework for Biodiversity Assessment

The proposed modification has been assessed in accordance with the Framework for Biodiversity Assessment (FBA) including the requirements of the NSW Biodiversity Offsets Policy for Major Projects. A Biodiversity Assessment Report (BAR), Biodiversity Offset Package (BOP) and Bird and Bat Impact Assessment (B&BIA) have been prepared as part of the environmental assessment.

The OEH has reviewed the BAR and associated mapping as submitted via the Biobanking assessment methodology (BBAM) tool. Overall, the vegetation mapping adequately captures the extent and condition of endangered ecological communities (EECs) in accordance with the OEH advice provided to the consultants.

The locations of turbines and tracks appear to have avoided, where possible, the moderate to good condition EECs in favour of low condition EECs. In terms of clearing there will be a direct loss of 168.7 ha of native vegetation which includes the following EECs:

- 8.45 ha of PCT 510 Blakely's Red Gum– Yellow Box grassy woodland of the New England Tableland Bioregion,
- 61.92 ha of PCT 554 Ribbon Gum – Mountain Gum – Snow Gum grassy open forest or Woodland of the New England Tableland Bioregion
- 2.68 ha of PCT 507 Black Sallee - Snow Gum grassy woodland of the New England Tableland Bioregion.

The consultants do not appear to have accurately used the BBAM tool to predict species credit species based on habitat features present in order to identify them for a targeted survey (as per 6.5.1.7 of the FBA). The black-throated finch, Boorolong frog, pale-headed snake and *Callistemon pungens* should be selected as candidate species based on the habitat features present. If these are not able to be surveyed due to the time of year or seasonal conditions, then an expert report may be provided by a suitable expert in consultation with OEH.

Other information that should be provided in the BAR is as follows:

- The location of assessment circles (3.2.1.3)
- All rivers and streams that occur within the development site and outer assessment circle including stream order classifications (4.1.1.9)
- Extent of native vegetation (5.1.1.1)

Measures proposed to avoid and minimise the direct impacts of the proposal in the BAR in accordance with section 8.3 of the FBA during the construction phase appear to lack detail. The BAR proposes that the existing Flora and Fauna Management Plan (FFMP) will be updated to incorporate protocols for pre-construction and construction phases for Stage 2. No measures appear to be proposed for the operational stage.

The BAR states the associated risks such as potential for bird and bat collisions are currently being considered independently and are not addressed in the report. As these impacts are proposed to be addressed in post approval documents, OEH requests the opportunity to review the draft Flora and Fauna Management Plan (FFMP), Bird and Bat Adaptive Management Plan and other relevant draft post approval documents that address mitigation measures for the Stage 2 development to comment on the adequacy of proposed mitigation measures.

The BAR states that the nearest record for McKies Stringybark (*Eucalyptus mckieana*) is approximately 14 km southwest of the proposal site. This does not appear to be accurate as a 2016 record of this listed species occurs 1 km to the west of the impact area near the proposed location for Turbine 129 in a Stringybark Forest community in the proposed biobank site. However, the species is known to occur on granite soils and is therefore unlikely to occur in the impact area (pers. com. Greg Steenbeeke 13/03/2018).

OEH Recommendations

1. The assessment undertaken under the Framework for Biodiversity Assessment (FBA) should be amended to consider the black-throated finch, Boorolong frog, pale-headed snake and *Callistemon pungens* as species credit species according to habitat features present across the site (as per 6.5.1.7 in the FBA).
2. The BAR should be amended to include information on:
 - The location of assessment circles (3.2.1.3)
 - All rivers and streams that occur within the development site and outer assessment circle including stream order classifications (4.1.1.9)
 - Extent of native vegetation (5.1.1.1).
3. OEH should be given the opportunity to review the draft Flora and Fauna Management Plan (FFMP), Bird and Bat Adaptive Management Plan and other relevant draft post approval documents that address mitigation measures for the Stage 2 development and provide comment on the adequacy of proposed mitigation measures.

2.2 Bird and Bat Strike Impact Assessment

The potential impacts of the modified WRWF Stage 2 development on birds and bats have been assessed separately to the FBA. The Bird and Bat Impact Assessment (B&BIA) by Brett Lane and Associates (BL&A) (Appendix 6 August 2017) states it has considered the changes to blade tip heights (up to 200 m) and blade lengths (up to 85 m) as well as changes to turbine locations and additional turbine sites.

Birds

The B&BIA uses data from bird surveys in Spring 2016 and Autumn 2017 that collected bird flight height data. There are six bird survey locations within a large impact area and there do not appear to be surveys of some of the new turbine locations, particularly in the eastern area. Also, this assessment was only undertaken to a height of 120 m and the turbine models now under consideration would have a tip height at 200 m. Hence, this may not be an adequate dataset to assess the impacts on birds arising from the new turbine locations and the OEH recommends further survey work as described below.

Bats

For bats, the B&BIA states the proposed modification with larger and higher turbines is unlikely to cause significant adverse impacts to the populations of threatened and non-threatened bat species. This is because the threatened species (Eastern Bent-wing Bat, Eastern False Pipistrelle, Eastern Freetail Bat and Eastern Cave Bat) are at very low numbers, and likely to fly mostly at or below the new Rotor Swept Area (RSA) height minimum. The B&BIA also asserts on page 4 that most bat species are known to fly below 50 m in height but this claim does not appear to be supported by any references or data.

A 2017 study conducted by OEH in southern NSW used bat detectors mounted on helium filled balloons to sample bats flying 70-130 m above the ground and compared this to detectors mounted in trees sampling bats flying within 30m of the ground. The study found that bat activity was 1.3 times greater closer to the ground (1,319 passes) than at 70-130 m above the ground (1,008 passes).

All bat species in the study area including the smallest were recorded flying at elevation however, the relative proportion of bat species activity varied with elevation. This is consistent with bat strike data from Australia and overseas which indicates that a broad range of species may encounter turbine blades.

The bat assessment is based on the results of a previous 2015 bat survey by BL&A. The OEH did not receive a copy of the 2015 report (referenced as the *White Rock Wind Farm Bat Pre-construction Surveys 2015* by BL&A 2016) as it was not part of the exhibition package. The B&BIA describes the survey locations as being distributed evenly across representative habitats near planned turbines but does not appear to map these locations. Hence, it appears unlikely that surveys were undertaken in the new turbine areas given that these had not been identified in 2015. Data was collected at ground level only and not within the RSA. Also, the report does not list the bat species recorded on each occasion including threatened species.

The OEH has been notified by BL&A that the carcass of a yellow-bellied sheath-tail bat (YBSB) (*Saccolaimus flaviventris*), a threatened species in NSW, was found near Turbine 65 on 16/02/2018. BL&A has advised that the individual's injuries were consistent with blade strike. The YBSB was not identified in the 2015 study and was not included as a likely species in the B&BIA for the Stage 2 modification.

Five of the threatened bats (YBSB, Eastern Bent-wing Bat, Eastern False Pipistrelle, Eastern Freetail Bat and Eastern Cave Bat) are known (or have the potential) to fly at the RSA height. The B&BIA does not appear to have adequately surveyed for bats in the new turbine locations or adequately addressed the impacts of the change in RSA, particularly on these threatened bats.

The OEH has identified an apparent typographic error on page 9 of the B&BIA where it is stated that under the proposed modification there will be an increase of the total area of RSA between 30-40 m with an associated decrease in the risk to birds flying at that height. This error should be corrected.

Wedge-tailed Eagles

Although they are not a threatened species, Wedge-tailed Eagles (WTE) are known to be at risk from wind farm impacts. The B&BIA acknowledges there may be an increased risk of collision by WTEs, other high-flying raptors and White-throated Needletails which are a listed migratory species under Commonwealth biodiversity legislation. The B&BIA concludes the risk is low given the low numbers of birds likely to be flying over the site, the low frequency with which these flights occur, and the non-threatened status of these species in mainland Australia.

The B&BIA states that there are possibly two WTEs nests on the site however their potential locations have not been mapped. There are measures in the BBAMP to address impacts on WTEs concerning lambing season, feeding of stock and feral animal control that could be applied for the Stage 2 development.

The OEH has compiled blade-strike data that shows impacts on WTEs are disproportionately greater than other species given their large range and low density in the landscape compared to other species. They are also long-lived and are thought to mate for life. Established breeding pairs are territorial and fiercely defend their nest sites. WTEs are most at risk when young and when first flying. They also appear to be at high risk when sub-adults are dispersing from their natal territories. Courtship displays and defending territories can result in them striking turbines, and this is anecdotally more likely to happen around nest sites.

The loss of raptors should be averted, as these species regulate the food chain and maintain a stable equilibrium in nature. Predator-prey relationships can be complex, and losses of top order predators can create imbalances in ecosystems. In addition, cumulative impacts of numerous wind farms in a region could lead to WTE's becoming regionally threatened, like the Tasmanian WTE.

2.3 Assessment Requirements

The original Major Project (MP) SEARs required the Environmental Assessment (EA) to assess the impacts on birds and bats from blade strikes, low air pressure zones at the blade tips (barotrauma, including the potential nature/extent of impacts, significance of such impacts on threatened species and mitigation measures), and alteration to movement patterns/flight paths resulting from the turbines

to be assessed and demonstrating how the project has been sited to avoid and/or minimise such impacts. That EA was also to consider roosting and nesting sites for aerial species and if any of the bird or bat species were likely to be impacted by the wind turbines then the significance assessment for each of the species had to consider impacts from the wind turbines as well as impacts from habitat loss. The cumulative impacts of other wind farms were also to be identified.

The EA for this modification should address the original MP SEARs and should provide the following information:

- an assessment of alteration to movement patterns/flights paths resulting from the new turbine locations including demonstrating how the project has been sited to avoid and/or minimise such impacts
- an assessment of the roosting and nesting sites for aerial species (including the Wedge-tailed Eagle) including an assessment of distances from turbines and associated impacts and demonstrating how the project has been sited to avoid and/or minimise such impacts.

In addition, further consideration should be given to the impacts on birds and bats from blade strikes, low air pressure zones at the blade tips (barotrauma), including the potential nature/extent of impacts, significance of such impacts on threatened species and mitigation measures.

2.4 Bird and Bat Adaptive Management Plan

A *Bird and Bat Adaptive Management Plan* (BBAMP) dated April 2017 prepared by BL&A was approved by the DPE in July 2017 for Stage 1. We also note the Stage 1 BBAMP has assigned a 'negligible' risk to five of the threatened bats (YBSB, Eastern bent-wing bat, Eastern false pipistrelle, Eastern freetail bat and Eastern cave bat) even though these are known (or having the potential) to fly at the RSA height of the Stage 1 turbines. However, discovery of the YBSB carcass suggests that the level of risk may be higher than that anticipated. The BBAMP should reassess risks once more data is collected.

OEH Recommendations

The OEH recommends that:

4. Additional bird and bat surveys should be undertaken, particularly in the new turbine location areas to further inform the Bird and Bat Impact Assessment and subsequent Bird and Bat Adaptive Management Plan for Stage 2.
5. An assessment should be undertaken of alteration to bird and bat movement patterns/flights paths resulting from the new turbine locations including demonstrating how the project has been sited to avoid and/or minimise such impacts.
6. An assessment of the roosting and nesting sites for aerial species (including the Wedge-tailed Eagle) should be undertaken including an assessment of distances from turbines and associated impacts and demonstrating how the project has been sited to avoid and/or minimise such impacts.
7. The Bird and Bat Impact Assessment should further consider the impacts on birds and bats from blade strikes, low air pressure zones at the blade tips (barotrauma), including the potential nature/extent of impacts, significance of such impacts on threatened species and mitigation measures. This should include consideration of the Stage 2 proposal only using the GW140 turbine models to reduce potential impacts on birds and bats by maximising the rotor ground clearance.
8. The risks to threatened bat species should be reassessed once data has been collated from the two-year monitoring phase for the Stage 1 project and this used to inform a Stage 2 Bird and Bat Adaptive Management Plan.

3.0 Aboriginal cultural heritage

The OEH has reviewed the documentation provided and notes inconsistencies between the EA main document (page 90) and the recommendations of the Aboriginal Cultural Heritage Assessment (ACHA) prepared by NGH Environmental dated December 2017 (pages iv, v & 47). The OEH supports the 11 recommendations listed on Page 47 of the ACHA but notes that while Point 8 on page 90 of the EA may capture the intent of both Recommendations 1 and 9 of the ACHA, Recommendation 11 of the ACHA is not reflected in the EA. This inconsistency should be corrected.

Recommendation 11 concerns conducting an onsite meeting with the registered Aboriginal parties to discuss heritage management issues and the ongoing development of the project. This recommendation is important as the management of known and unknown Aboriginal cultural heritage within the development area is dependent on the Cultural Heritage Management Plan (CHMP) and any potential update of the CHMP to include the expanded Stage 2 area. The draft proposed amended CHMP that will include Stage 2 should be informed by the proposed on-site meeting with all the registered Aboriginal Parties.

The OEH welcomes the opportunity to comment on the draft amended CHMP.

OEH Recommendation

9. Recommendation 11 of the ACHA concerning an on-site meeting with the registered Aboriginal parties to discuss heritage management issues and the ongoing development of the project should be implemented.

