

Liverpool Range Wind Farm

Fact Sheet
October
2021

Visual Impact Fact Sheet



Why was the assessment undertaken?

Wind farms can potentially affect the visual amenity of the surrounding area. The degree of visual impact depends on the extent of change to the landscape caused by the development.

A Visual Impact Assessment (VIA) was prepared by Moir Landscape Architecture Pty Ltd to assess the potential visual impacts associated with the following key changes to the approved wind farm layout and design proposed by the Modified Project:

- Increase in maximum blade tip height to 250 metres (m) above ground level (AGL) (increase of 85 m)
- Decrease in maximum number of turbines to 223 (removal of 44 wind turbines).
- Revised turbine layout and associated infrastructure such as substations
- Inclusion of an indicative 150 MW/300 MWh capacity Battery Energy Storage System (BESS)

The VIA presents a comparative analysis of the Approved Project and the Modified Project and assessed the change in potential visual impact.



What was the approach?

The VIA was prepared considering the relevant Conditions of the Development Consent SSD 6696 and in accordance with the guidelines within the NSW Wind Energy: Visual Assessment Bulletin for State significant wind energy development (DPE, 2016) (the Visual Assessment Bulletin) relevant to a modification application, and all relevant publications, guidelines, Acts and Regulations. The key purpose of the VIA was to assess the change in potential impacts between the Approved Project and the Modified Project and, wherever relevant, to recommend appropriate mitigation strategies to minimise identified potential visual impact.

A range of methodologies were used to generate comparisons of visual impact including zone of visual influence modelling, wireframe diagram analysis from representative dwelling locations, and preparation of photomontages from key public viewpoint locations.

The Visual Assessment Bulletin provides guidance on the distances from turbines within which more focused attention should be placed in the assessment of visual impact of wind turbines, referencing the 'black line' and 'blue line' of visual magnitude (see graphic below). Within the 'black line' of visual magnitude impacts should be managed as far as practically possible, residual impacts justified, and proposed mitigation measures described. Screen planting is to be considered for non-associated residences between the 'black line' and 'blue line' of visual magnitude (3,350 m - 4,950 m).

Visual Magnitude Thresholds



(Source: Visual Assessment Bulletin)

Updated base photography was taken at a number of public viewpoint locations (such as along public roads and Coolah Tops National Park) and were used to prepare high-definition photomontages of the turbines and transmission line infrastructure. Photomontages are accurate depictions of the proposed infrastructure modelled in its geographic location and at an appropriate scale that is superimposed over base photography, which assists the viewer to conceptualise the proposed development within its landscape context.

Representative Wire Frame Diagrams (WFD) were prepared from 14 non-associated residence locations within 4,950 m of a proposed wind turbine. The WFDs are computer generated vector models of the proposed infrastructure on a digital contour base, again used to assist the view to conceptualise the proposed infrastructure from a particular viewpoint location.

While night lighting on turbines or met masts is not currently proposed, the VIA undertook a visual impact assessment of night lighting in accordance with the Dark Sky Planning Guideline (DPE, 2016) as the Project is located within the assessment area of the Siding Springs Observatory. The Aviation Impact Assessment (AIA) prepared for the Modified Project concludes that aviation obstacle lighting of turbines or met masts is not warranted as they would not create an adverse hazard to aviation activity in the area at night. Despite this, the Civil Aviation Safety Authority (CASA) however may recommend night lighting is installed at the Project site for aviation safety purposes, which would need to be considered by the Project. To compare the degree of change in potential visual impacts, the VIA prepared by Moir Landscape Architecture Pty Ltd builds upon the findings of the Landscape and Visual Impact Assessment (and Addendum) prepared for the Approved Project by Green Bean Design Pty Ltd in 2014 (and 2017). In accordance with the Visual Assessment Bulletin, an analysis of the number of visible turbines in each of the 6 x 60 degree sectors (i.e. within a 360 degree view) around each residence location was undertaken for the Modified Project and the Approved Project turbine layouts and configurations.

What did we find and how does it compare to the Approved Project?

The VIA found that the nature and extent of potential visual impacts associated with the Modified Project are generally consistent with those associated with the Approved Project and can be mitigated/managed appropriately. The table below provides a snapshot of the potential impacts associated with the Modified Project and a comparison against what was previously found for the Approved Project. The reference to Dwelling Zones 1-6 in the table below refers to the six geographic clusters of non-associated residences that surround the LRWF site developed by Green Bean Design Pty Ltd in the original Landscape and Visual Impact Assessment prepared in 2014/2017.

	Approved Project	Proposed Modified Project	Variation
Visual magnitude of layout	Black Line: 2,200 m Blue Line: 3,300 m	Black Line: 3,350 m Blue Line: 4, 950 m	Increased visual magnitude threshold of: 1,150 m (Black Line) 1,650 m (Blue Line)
Number of non-associated residences within black line of visual magnitude	4	15	+11
Number of non-associated residences within blue line of visual magnitude	10	45	+35
Number of non-associated residences with multiple 60° sectors within which a turbine is visible	Up to 3 x 60º sectors: 19	Up to 3 x 60º sectors: 24	Increase in five non-associated residences with turbines in three 60 ^o sectors.
	Up to 4 x 60º sectors: 4	Up to 4 x 60º sectors: 4	
	Up to 5 x 60º sectors: 0	Up to 5 x 60º sectors: 0	
	Up to 6 x 60º sectors: 0	Up to 6 x 60º sectors: 0	
Visual Impact Rating (Dwelling Zone 1) (10 x non-associated dwellings)	Low-Medium visual impact rating at 8 x non-associated residences Low visual impact rating	Low-Medium visual impact rating at 9 x non-associated residences (includes one newly identified non- associated dwelling)	No change in visual impact ratings for previously assessed non-associated dwellings. One additional non-associated dwelling identified and assessed as Low—Medium (Dwelling ID: 1). Mitigation measures recommended.
	at 1 x non-associated residence	Low visual impact rating at 1 x non-associated residence	
Visual Impact Rating (Dwelling Zone 2) (12 non-associated dwellings)	Medium visual impact at 7 x non-associated residences Low-Medium visual impact rating at 4 x non-associated residence	Medium visual impact rating at 8 x non-associated residences (includes one newly identified non- associated dwelling) Low-Medium visual impact rating at 4 x non-associated residence	No change in visual impact ratings for previously assessed non-associated dwellings. One additional non-associated dwelling identified and assessed as Medium (Dwelling ID: 2). Mitigation measures recommended.
Visual Impact Rating (Dwelling Zone 3) (9 x associated dwellings)	Medium visual impact at 9 x non-associated residences	Medium visual impact at 9 x non-associated residences	No change in visual impact rating. Mitigation measures recommended.
Visual Impact Rating (Dwelling Zone 4) (19 x non-associated dwellings)	Medium visual impact at 19 x non-associated residences.	Medium visual impact at 18 x non-associated residences.	No change in visual impact rating. Mitigation measures recommended.
Visual Impact Rating (Dwelling Zone 5) (2 x associated dwellings)	Low-Medium visual impact at 2 x non-associated residences	No non-associated dwellings.	2 x dwellings are now associated.
Visual Impact Rating (Dwelling Zone 6) (10 x non-associated dwellings)	Low-Medium visual impact at 7 x non-associated residences	Low-Medium visual impact at 8 x non-associated residences (includes 1 x newly identified non- associated dwelling) Very Low visual impact rating at 2 x newly identified non-associated dwellings	No change in visual impact ratings for previously assessed non-associated dwellings. 3 x newly identified non-associated dwellings: - 1 assessed as Low to Medium visual impact rating - 2 assessed as Very Low visual impact rating Mitigation measures recommended.

The VIA determined that the changes in turbine size and layout proposed by the Modified Project would be discernible from some surrounding and proximate view locations. While the Modified Project results in an additional non-associated residences being included within the blue line assessment area (4,950 m), the visual impact ratings for the Modified Project remain consistent with Approved Project.

Overall, the number of visible wind turbine hubs and blade tips (as modelled) would be subject to marginal increases and decreases from residences within 4,950 m of a turbine proposed by the Modified Project.

Despite the proposed increase in maximum blade tip height, at some residences around the Project site there is expected to be a decrease in the overall number of visible turbines due to the revised turbine layout proposed by the Modified Project compared to the Approved Project.

Although the vertical scale of the turbine proposed by the Modified Project has increased, the VIA concludes that the magnitude of change to the surrounding visual landscape resulting from the Modified Project is largely consistent with the level of change that was deemed acceptable for the Approved Project.

The VIA determined the proposed changes to ancillary infrastructure associated with the Modified Project would not result in any additional visual impacts to those associated with the Approved Project.

Further, as there are no other nearby wind farms that have been approved, under construction or in operation, there are no cumulative impacts to assess. The proposed Valley of the Winds Wind Farm project west of Coolah township and TransGrid's Central-West Orana Transmission Line project are both in the early planning phases and have not yet lodged development applications, and therefore will be required to assess the potential cumulative impacts of the Liverpool Range Wind Farm project.

What are the proposed mitigation strategies?

Implementation of off-site landscape works is the key measure to mitigate potential visual impacts at surrounding residences.

The VIA recommends that screen planting or supplementary planting is made available to non-associated residences within 4,950 m of the nearest turbine proposed by the Modified Project. This equates to an increase of 950 m to the distance currently specified in the Development Consent. This recommended increased distance within which mitigation measures should be offered is a result of the change in visual magnitude associated with the proposed increase in maximum blade tip height, consistent with the NSW Visual Assessment Bulletin.

Assessment against Development Consent

The Modified Project can comply with the intent of the existing conditions of the Development Consent relating to visual impact, in particular:

- Mitigation measures will be made available for a period of 5 years from the commencement of construction to relevant non-associated residences upon request.
- All reasonable and feasible efforts will be made to minimise off-site visual impacts associated with the Modified Project.
- Wind turbines including the tower will be painted in a non-reflective off-white colour.
- Ancillary permanent ancillary infrastructure such as substations, overhead power lines, and Operations and Maintenance (O&M) facility will be finished in a manner to blend in as far as practicable with the surrounding landscape.
- No advertising or logos will be mounted on turbines or ancillary infrastructure.
- All outdoor lighting will comply with all relevant standards to minimise off-site lighting impacts as far as practicable.

The Development Consent will however require minor amendment to reflect the findings of the VIA, in particular:

• Increase in the distance out to which visual impact mitigation measures are available to non-associated residences from 4 km to 4,950 m (increase of 950 m) from the nearest proposed turbine.

 For more information, please visit the website below

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