

Powerful Grounds to Reject Modification 1 Proposal for Sapphire Wind Farm

Dr Michael Crawford

29th March 2016

The proposed Sapphire Wind Farm Modification 1 should be rejected. It is a massive change to what was originally approved which will have great impact on the local community. The visual impact assessment provided in support of the proposal is profoundly defective and the noise impact assessment fails to take account of factors that cause risk to the health of residents.

The proposed Sapphire Wind Farm Modification 1 should be rejected. It is a massive change to what was originally approved which will have great impact on the local community. The visual impact assessment provided in support of the proposal is profoundly defective and the noise impact assessment fails to take account of factors that cause risk to the health of residents.

In addition, the Department's curious involvement with Green Bean Design (GBD) over the RAM used for VI indicates an association that reasonably calls into question the Department's alignment with developers' agents; and the manifest scientific and policy defects in RAM, which GBD claims was created by the Department, indicate a serious lack of knowledge within the Department about relevant scientific research and reviews related to VI assessment. Consequently the Department appears to have neither the competence nor the demonstrable independence to impartially review the VI of the proposed modification.

Visual Impact Assessment

Anyone who cares to do the maths will discover that with this proposal:

- turbine height **increases** by 37% against approved layout A and 27% against layout B;
- turbine swept area (i.e. the most visible, moving part of the structure) **increases** by 132% against layout A and 23% against layout B;
- total swept area (i.e. individual turbine swept area * number of turbines) **increases** by 59% against layout A and 8% against layout B.

The effect is even more pronounced for the areas around Swan Vale and Sapphire. Numbers have been reduced by eliminating the Wellingrove cluster, while increasing turbines in the other two clusters relative to Layout B. The consequence is that:

- for the Swan Vale cluster, total swept area **increases** by 118% against layout A and 50% against layout B;
- for the Sapphire cluster, total swept area **increases** by 94% against layout A and 29% against layout B.

In both cases this is additional to the height increase of 27% to 37%. Collectively these are massive changes for the areas impacted by the Swan Vale and Sapphire clusters and will have adverse consequences for visual impact (and infrasound generation).

The consultant's statement claims "The ZVI diagram illustrates that the proposed modification will have no significant overall increase in visual presence across the project viewshed" (p. 3). That is called putting lipstick on a pig.

The reason there is little change in who can see the turbines, is that at the lower heights they were already visible to virtually everyone within 5kms, to a large proportion off the surrounding area out to 7 kms, and to a substantial proportion of the surrounding area out to more than 15 kms (see Fig 3 in consultant's report). So while the number of properties visually impacted by the wind farm will not increase by much (there being few left to gain a view), for those properties, the turbines will now be 27% - 37% higher, with visible turbine swept area increasing for viewers by at least 23% - 132%.

In fact if turbines under layout A or B would have been partially obscured, then in general the swept area visible to viewers under the modification will have a much larger increase. For

instance, for a viewer with a partial obstruction between them and a turbine the proportionate increase in visible swept area relative to layout A (146m) and B (157m) will be respectively:

- 100m obstruction: 254% and 115%
- 120m obstruction: 489% and 198%
- 140m obstruction: 3,325% and 526%

None of this detail appears in the VIA because it provides no details in relation to virtually all potentially impacted residences. In each case the rights of individual landowners are being affected and the consultant does not deign to provide demonstrable evidence of the impact of the proposed modification on each. Instead, the consultant, who is of course paid by the developer, expects the Department to take their word for what they claim will be slight consequences.

The VIA actually says “The determination for a potential increase to visual impacts associated with the approved Sapphire Wind Farm has been based upon professional judgement” (p. 13)

The Department should be familiar with scientific research and reviews relating to visual impact assessment over the last few decades which demonstrate:

- the inter-rater reliability of professionals (i.e. the consistency between different individuals) when assessing the various factors commonly used to rate visual character is *low*, and the reliability of assessments about the difference between before and after a development are *even lower*¹; and
- “The difference between what professionals value and what the public values is profound.”²

Unless the consultant has produced demonstrable quantitative evidence of the reliability and validity of their judgements (and being employed a lot by wind farm developers is not evidence of anything other than satisfying developers), then the Department should be insisting on tangible evidence of the visual impact on each potentially affected property.

It is noticeable that in an apparent attempt to bolster their assertions of negligible visual impact from the change, the consultant has brought in the application of a VI scale called Refined Assessment Matrix (RAM) which they have applied to a small number of properties. The consultant says this has been developed by the Department (p. 11).

That scale has numerous gross defects, from both a scientific and administrative perspective, which have been detailed in a letter (attached) to the Secretary of the Department. The fact that the consultant is apparently unable to themselves identify those defects, and chooses to use the scale, casts serious doubt on the validity of any assertions they make about changed visual impact as it will be experienced by residents as a consequence of Mod 1.

¹ *Evaluation of Methodologies for Visual Impact Assessments, NCHRP Report 741*, Transportation Research Board of the National Academies, Washington DC, 2013, pp. 34-37 and 39-40.

² *Op cit*, p. 139.

Noise Impact

The Department has in some other recent wind farm cases been pushing the erroneous line that, according to its interpretation of an NHMRC press release, there cannot be any risk to health from emitted infrasound beyond 1,500 metres from a wind farm. The misrepresentation of the NHMRC's statements have been pointed out in a submission to the Crudine Ridge Wind Farm PAC.

The Department should now be aware that the NHMRC has commissioned two research studies into the potential impact of infrasound on human health, allocating a total of \$3.3 million to those studies out of the \$5 million it has budgeted for this research. The research programs do not make any mention of the 1,500 metres boundary which the Department has been pushing.

Research has shown that "The data illustrate that sound emissions from wind turbines generally increases with turbine size"³. The proposal increases blade length as well as height.

Raising the height of the tower and thus the height of infrasound and other noise generation and emission potentially changes the transmission effects in ways that have not been scientifically validated for modelling. [The Department should ask the noise modellers for the peer-reviewed scientific research that supports their modelling of infrasound and other noise transmissions from towers of the proposed height.]

In the light of the research the NHMRC has commissioned, the Department needs to adhere strenuously to the precautionary principle it espouses until the NHMRC produces its results. That means, in this case, not increasing the height of towers and blade length.

The Department has also had a willingness to ignore potential health impacts on hosts and on residents in other associated properties, where those parties are subject to agreements in apparent contravention of the *NSW Work Health and Safety Act 2011 No 10* (WHS Act), which imposes certain duty of care obligations on anyone conducting a business in NSW, which obligations extend beyond their employees to include "other persons", and which obligations cannot be contracted away.

The Department needs to be very careful that its assessment of health risks due to noise or other emissions in relation to the modification proposal does not make it complicit in a breach of the WHS Act.

³ Anthony L. Rogers, James F. Manwell and Sally Wright, "Wind Turbine Acoustic Noise", Renewable Energy Research Laboratory, Department of Mechanical and Industrial Engineering, University of Massachusetts at Amherst, June 2002 amended January 2006, p. 20.