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**WIND FARM AT STRABOY, GLENTIES, DONEGAL**

**Supplementary Proof of Evidence of Dick Bowdler**

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## **1 INTRODUCTION**

1.1 This supplementary evidence is produced in response to the noise assessment presented in evidence by Mr O'Reilly at the hearing.

## **2 GENERAL**

2.1 I would like to make some general comments on Mr O'Reilly's text.

- He says, about half way down page 6 of his evidence, that wind turbine noise is less objectionable than industrial or traffic noise. I can't agree with that. [DOC – Extract from Book]. The extract I provide shows that turbine noise is about 5dB more annoying than most other sources.
- On page 23 – 3rd Para. "There have been no instances of aerodynamic modulation (AM) being a factor at any wind farm site within the island of Ireland". This is a very broad statement. I am only familiar with a dozen or so wind farm sites in the island of Ireland but I know that, at Wolf Bog in Antrim, the environmental health officer has heard AM at about 2km distance.
- I am puzzled by Enercon's comments as related under Amplitude Modulation on page 23 – that they have no experience of AM with any Enercon turbine. The first academic report that raised awareness of the potential problem of AM – in 2003 - is "Effects of the Wind Profile at Night on Wind Turbine Sound". [DOC]. This relates to Enercon turbines (footnote on page 15). I'm not suggesting that will necessarily happen here, merely that it is not ruled out.

## **3 PROCEDURE FOR BACKGROUND NOISE MEASUREMENT.**

3.1 Mr O'Reilly says, at the end of section 3.1 of his evidence, that he uses ETSU-R-97 to make his assessment. He uses ETSU-R-97 for the

establishing of background noise levels (see bottom of page 6) so I set out here the main principles in ETSU-R-97. [DOC selected pages from ETSU].

- 3.2 A background noise survey needs to be carefully planned. At the start of the section on Background Noise on p 83 ETSU-R-97 explains how the EHO from the relevant Council should be involved in discussions and in setting appropriate limits. On p99 of ETSU-R-97 where it sets out the requirements for monitoring locations it explains how the EHO should be involved in the selection of properties and, in particular *The precise locations at which the background noise surveys should be made at each property should be agreed in consultation with the local authority/EHO.* As far as I am aware none of this was done.
- 3.3 In connection with measurement locations ETSU-R-97 explains on pages 83 and 84 where background noise measurements should be made. In principle they should be made in areas used by residents of a property for rest and recreation.
- 3.4 In the Shipdham Inquiry [DOC] held in December 2008 there was a question of whether the appellant's noise measurements, which were made in a field immediately adjoining the garden of the noise sensitive property (NSP), or those made by Dr Hoare and the Council in the garden of the NSP were representative. In her decision the inspector discusses this at Paras 21, 22 and 23 and says that she has *reached the view that the background noise measured at Ecotricity's measurement site is unrepresentative of the background noise at the 3 NSPs. This is because Ecotricity's measuring site has the potential to be noisier than the areas used for rest and relaxation at the 3 NSPs, and its measurements of background noise could therefore be overstated.* In his decision on the Grise Wind Farm [DOC] at 11.48 onwards, the inspector criticised several of the background noise measurement locations. It does not appear to me that the locations chosen complied with best practice. The locations are shown in my document "Noise Monitoring". [DOC]
- 3.5 On page 85 ETSU-R-97 says *It is expected that to avoid the results being weighted by unrepresentative conditions at least 1 week's worth of measurements will be required. The actual duration will depend upon the*

*weather conditions, in particular the strength and direction of the wind that has blown during the survey period and the amount of rain.* In other words the measurement period needs to be representative of normal or average conditions at the property. Further, on page 99 it says *The background noise survey should be taken over a sufficient period of time to enable a reliable assessment of the prevailing background noise levels at each property to be made. As a guideline, an appropriate survey period might be 1 week, although the actual duration will depend upon the weather conditions, in particular the wind speed and direction during the survey period. It must be ensured that, during the survey period, wind speeds over the range zero to at least 12m/s (10min average at 10m height), and a range of wind directions that are typical of the site, are experienced.* It does not appear that this has been done. We can look at the graphs in Mr Reilly's evidence. At night there is hardly anything above 8m/s. ETSU-R-97 also requires that you get the full range of wind direction. There is no indication of whether this was done or not.

- 3.6 But probably the most crucial point is that, on p 101 and elsewhere of ETSU-R-97 it says *At the end of the survey period, data recorded during periods of rainfall, or afterwards, where rainfall may have affected flow in nearby rivers or streams, should be discarded. So in rainy periods the period of data collection needs to allow for this and sometimes the effects of heavy rain in burns can persist for several days.* Mr O'Reilly says that he took out period of rain but, as is clear from my quotation above, ETSU-R-97 requires periods **after** rain to be taken out when excess noise from watercourses persists. If we look at weather in period there is a lot of rain in the first half of the measurement period. [DOC].
- 3.7 Mr O'Reilly's Table 3. At low wind speeds when there is little or no wind noise the day and night noise levels are the same. Night levels are usually lower. Of course the explanation is that it is water noise following periods of rain. At H18 particularly – the highest one – the location is close to the main watercourse coming down from Lough Nacroaghy.
- 3.8 There are certainly watercourses round H28 which I have heard but I did not visit the location at H25. The point is that first – even though this is a wet area – this amount of water is not typical of the whole year. Secondly,

even if it is typical of H18 for example – that background noise data cannot be used at other locations where there is no water noise.

3.9 I have set out in 5.8 & 5.9 & 5.10 of my original evidence the reason why wind measurement should be done with a tall mast. Here the mast was only 10m high. I am not clear why the tall met mast already up on the site was not used. The use of a short mast would have resulted in increased noise levels as I explained in my original evidence.

#### **4 NORTH OF THE SITE**

4.1 As I pointed out in my main evidence the two properties on the north west of the site were not considered in the ES. Nor were they considered in Mr Reilly's evidence. This whole valley on the north side of the ridge is a particularly quiet area. It rarely has any detectable noise from road traffic or other human activity. It is a classic tranquil area and the further up the valley you go the more tranquil it becomes. In setting out his experience Mr O'Reilly refers to a report he co-authored in 2000 called "Environmental Quality Objectives". [DOC]. It is a document that discusses the Quiet areas. It says on the introductory page:

- *Landscape, wildlife and the sounds of nature combine to form our natural environment. Tranquil areas are part of our natural resource; they provide places for contemplative recreation, solitude and reflection where one can experience a symphony of sounds and a sense of place. The natural soundscape is an indicator of environmental quality; it is part of our heritage and environment, important for wildlife and biodiversity.*

4.2 On page 20 of the same document it says *The noise from anthropogenic sources should not be clearly audible at any point within quiet areas.* Turbine noise in this valley and at these two houses will not only be clearly audible a times but will dominate the soundscape.

4.3 On the north East of the site the same applies arguably to a lesser extent. H28 is still affected by some traffic noise as well as water noise but once you go further up the road it is much quieter. Properties H27 and H53

have turbine noise levels of up to 42 and 41dB respectively. No background noise measurements were made there.

- 4.4 The Archaeologist, on his slide 5, said that a major impact – the top category of impact – was “an impact which obliterates sensitive characteristics”. Turbine noise in these quiet areas will be up to four times as loud as the quiet background noise and that must obliterate tranquillity.