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<b>Auchencloigh Wind Turbine – Review of Noise Report prepared on behalf of Residents of 1 Auchencloigh Farm Cottages</b>		<b>Ref: 17/0536/PP</b>
<b>Local Authority:</b> East Ayrshire Council	<b>Officer:</b> Graham Mitchell	<b>Contact details:</b> <b>Tel:</b> 01563 578213 <b>Address:</b> East Ayrshire Council Development Management Economy and Skills Johnnie Walker Bond 15 Strand Street Kilmarnock KA1 1HU <b>Email:</b> <a href="mailto:Graham.Mitchell@east-ayrshire.gov.uk">Graham.Mitchell@east-ayrshire.gov.uk</a>
<p><b>Background:</b> The Auchencloigh wind turbine development is a single wind turbine that was installed in 2015. It has recently been determined that the turbine was installed at a location approximately 40 m south of the location described in the original planning consent for the development.</p> <p>The application is for retrospective permission for a single wind turbine at the as-built location. The turbine model is the NPS 100C-24-23 turbine of 34.2 m blade tip height, with a 24.4 m rotor diameter and a hub height of 22 m. The turbine has a generating capacity of 0.1 MW.</p> <p>The application site is located close to Auchencloigh farm which forms part of the small rural settlement of Auchencloigh, which is approximately 6 km to the south of Galston, East Ayrshire. The area is rural with the surrounding land principally used for agricultural purposes.</p>		<p><b>Requirement:</b> To review the submitted report prepared on behalf of residents living near to the Auchencloigh wind turbine proposal and to provide advice on its content in relation to the retrospective application.</p>

## **Review of noise report**

1. We have reviewed the report 'Wind Turbine at Auchencloigh Farm, Galston, Review of the Planning Application and Existing Turbine Noise', dated 6<sup>th</sup> August 2017, written by Dick Bowdler, Acoustic Consultant, on behalf of the residents of No 1 Auchencloigh Farm Cottages. The report reviews the two assessment reports prepared on behalf of the applicant by 24 Acoustics details as follows:
  - Wind Turbine at Auchencloigh Farm, Galston, ETSU-R-97 Noise Assessment, Technical Report R6905-1 Rev 0, 29th June 2017 (referred to in this report as the 'NAR')
  - Wind Turbine at Auchencloigh Farm, East Ayrshire, ETSU-R-97 Noise Compliance Assessment, Technical Report R6905-2 Rev 1, 14<sup>th</sup> July 2017 (referred to in this report as the 'NCA').ACCON's own review of the 24 Acoustics reports is presented in a separate report (Ref No: A2177/Auchencloigh/21, dated 04.10.2017), referred to here as the ACCON review. We note that Dick Bowdler is regarded as one of the United Kingdom's foremost experts on noise from wind turbines.
2. The Bowdler report covers much of the same ground as the ACCON review. This report therefore concentrates on additional points made in the Bowdler review and the differences in the observations or difference in their emphasis made by Bowdler compared with the ACCON report.
3. Paragraph 1.2 of the Bowdler report refers to the unusable data for the period 15<sup>th</sup> to 28<sup>th</sup> June at No 1 Auchencloigh Farm Cottages and questions whether a different sound level meter was used for the period prior to the fault developing. 24 Acoustics have provided the raw data to EAC which ACCON have examined. I can therefore confirm a RION NL-52 sound level meter was used at this location from 3<sup>rd</sup> May to 14<sup>th</sup> June when it was replaced with a RION NL-32 sound level meter, although no reason for the replacement is given in either of the 24 Acoustics reports. Therefore, it can reasonably be assumed that there is no particular doubt about the Auchencloigh Farm Cottages raw noise measurement data at least up until 14<sup>th</sup> June.
4. Paragraphs 1.3 and 1.4 make similar points to those made in the ACCON review about the 24 Acoustics meteorological mast location and the microphone windscreens employed.
5. Regarding the lack of background noise data obtained at the higher wind speeds, Bowdler states that this is "well short of the best practice requirement". ACCON agree this is a reasonable comment. Bowdler makes similar observations to ACCON in paragraphs 2.2 and 2.3 that the background noise levels obtained by 24 Acoustics are unrepresentatively high.
6. In relation to the compliance report (NCA), Bowdler highlights that the noise measurements at the proxy location do not meet the IOA GPG recommendations. Furthermore, he points out the potential uncertainties in the "conservative" calculations of measured turbine noise levels due to the failure to obtain a difference between operational and background noise of 3 dB or more. Bowdler provides an example demonstrating that the measured turbine noise level at 9 m/s would be calculated more than 1 dB higher than identified, if the measured operational level was only 0.5 dB higher and the background level 0.5 dB lower.
7. In paragraph 3.2 Bowdler indicates that he cannot understand Tables 8 and 9. ACCON agree that

there are errors and confusing terms used in these tables such that Table 9, in particular, cannot be readily understood.

8. Section 4 of the Bowdler report provides some useful text on the characteristics of wind turbine noise. The point is made that the noise limits provided by the authors of ETSU-R-97 are considered “to provide a reasonable degree of protection” on the basis of a constant and characterless noise. Where the noise contains a significant degree of amplitude modulation or otherwise is highly variable, there is likelihood that the ETSU-R-97 limits may not be appropriate or would require appropriate corrections to be applied in relation to any noise limits to be set.
9. Dick Bowdler has listened to and analysed a sample of a large number of video clips provided by the residents of No 1 Auchencloigh Farm Cottages, many of which appear to be recorded inside their house.
10. His analysis of the noise signals finds that there are two distinct features. There are high levels of amplitude modulation (AM) at a modulation frequency of 2 Hz to 2.5 Hz and also significant and continual variations in the level of noise generated by the turbine.
11. I have also listened to a number of the video clips and I can confirm the large variations in noise level from the turbine. Over time the turbine noise continues to fade in and out on a random basis. The characteristics of amplitude modulation can also be heard in the recordings. I therefore concur with Bowdler’s conclusions that the “considerable amplitude modulation ... is likely to have a significant impact on residents” and the variability of the turbine noise “is also likely to exacerbate the impact”.
12. **The report by Dick Bowdler provides further expert opinion that there are significant deficiencies in the applicant’s noise assessments. His analysis also demonstrates that the noise generated by the turbine contains significant amplitude modulation and a high level of variability. He considers that both of these characteristics are likely to cause annoyance to nearby residents.**

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Review

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