Noise

Sources of noise during operation of a wind farm are both mechanical (from machinery housed within the turbine nacelle) and aerodynamic (from the movement of the blades through the air). Modern turbines are designed to minimise mechanical noise emissions, whilst aerodynamic noise is controlled through the design of the blades and by the turbines' control systems.

Although noise from the wind turbines increases with wind speed, at the same time ambient background noise (for example wind in trees) usually increases at a greater rate. Planning conditions are used to enforce compliance with specified limits.

The effects of noise are being assessed as part of the ongoing EIA and in consultation with the Environmental Health Departments of Tyrone and neighbouring Councils.

The method of assessment is defined in ETSU-R-97, The Assessment and Rating of Wind Turbine Noise, which sets limits on the level of wind farm noise that is acceptable at nearby properties. These limits are based on the existing, windspeed-related background noise level. A Good Practice Guide to the use of ETSU-R-97 was published in May 2013 by the Institute of Acoustics, and the recommendations of this guide are being followed.

A background noise survey has been carried out at a number of locations around the wind farm site which are considered to be representative of the background noise environment of other properties in the area. These have been used to define noise limits, which are being used in the design process to ensure that the wind farm can be operated without causing unacceptable noise effects.



P:\Projects\1713 Doravil Noise II\Document Files\General\Noise\Noise Contour Plot Based on AW4-43T Interim Layout.mxd



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Aviation

Wind developments can affect aerodromes and other aviation infrastructure such as radar. The potential impacts are extensive and complex. Common issues include:

- Impact on radar caused by reflection of the signal by the moving blades. This can cause the wind turbines to be detected by Primary Surveillance Radar and appear as aircraft on a radar screen. It can also have consequences for other kinds of radar;
- Physcial safeguarding concerns wind turbines as large structures in the vicnity of an aerodrome can present a colision risk;
- Effect on procedures the minimum altitude at which aircraft can safely fly can be affected by large wind turbines.

An Initial Site Assessment for aviation and radar has been undertaken by Pager Power. This included consultation with Londonderry Airport, Belfast International Airport, NATS, and the Ministry of Defence (MOD). The report found that no impacts regarding aviation and radar are likely. Re-consultation with the relevant aviation stakeholders will be required once the layout has been finalised. Establishment of which turbines require aviation lighting will be required in consultation with the MOD.

Shadow Flicker

Rotating wind turbine blades can cause brightness levels to vary periodically at locations where they obstruct the sun's rays. This can result in a nuisance particularly when the sun is low in the sky and the shadow cast is over windows of residential properties. This intermittent shadow cast is described by the term 'Shadow Flicker' and it can be a cause of great annoyance at residences near onshore wind developments.

It is common to use 10 rotor diameters as a maximum limit at which effects can occur. The validity of this limit is discussed at length within the document entitled Update of UK Shadow Flicker Evidence Base (Parsons Brinckerhoff, 2011).

Formal assessment has not been undertaken with regard to shadow flicker effects. However, initial identification of residences that are within 1km (0.6 miles) of any turbine was undertaken in August 2014.



There are clusters of houses that are outside the 1 km (0.6 miles) buffer. These houses are unlikely to experience significant effects but may warrant consideration particularly if the layout changes.

Further Work Required

Detailed modelling of the potential shadow flicker effects will be undertaken once a layout has been finalised.

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Telecommunications

Wind turbines can affect wireless communication links in their vicinity. The main interference mechanisms are:

- Diffraction losses causing a weakening of the signal by turbines located on or close to the link path;
- Reflection of the trasmission between the link ends.

Diffraction issues apply to both microwave links and Ultra High Frequency (UHF) telemetry links. Reflection issues are generally of concern for UHF telemetry links only.

A desk based assessment has been completed. This included consultation with the relevant stakeholders and a detailed assessment based on published guidelines.

A few links have been identified in the area. In order to avoid impacts on these links, the turbines will need to be located outside of the relevant exclusion zones (set by the link operator). The position of the links, and their exclusion zones will be considered in finalising the layout.

Further Work Required

Further engagement with the link operators will be undertaken during the layout refinement process.

TV Reception

Wind turbines can, under particular circumstances, degrade domestic TV reception quality in their vicinity. This is mainly due to:

- Reflection of the transmitted signal by the wind turbine blades;
- Blocking of the transmitted signal by the wind turbine towers;
- Fluctuating power levels caused by the rotor 'chopping' the transmitted signal.

A detailed desk based TV assessment has been undertaken which has modelled the potential impact in the surrounding area. In addition, a baseline TV reception survey was carried out in the areas surrounding the proposed development.

Key Findings

A comprehensive search of transmitter and coverage maps revealed that the Brougher Mountain and Divis main transmitters, and the Strabane Relay transmitter are likely to provide television signal coverage within the assessed area.

The interference charts and maps produced showed that approximately 50% of the surrounding area will or already does receive a poor signal from the assessed transmitters. This predicted interference may be due to the hilly terrain within the assessed area.

Upon viewing the (limited) street view mapping of the area, it was noticed that many households are likely to be receiving a television signal via satellite. Any household receiving a signal via satellite will not be affected presence of the wind farm.

The overall TV interference impact is expected to be low. This is due to several reasons:

- The hilly terrain within the assessed area;
- The relatively small number of dwellings within the assessed area;
- The location of the proposed wind farm within the surrounding environment;
- The visibility of aerials to the transmitters, and;
- The overall signal coverage for the area as a whole.



Further Work Required

An update of the TV modelling for the finalised layout is to be undertaken and assessed in conjunction with the results of the baseline reception survey.

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