

Annex 16.5

Baseline Noise Assessment Methodology

(ERM)

16.1 INTRODUCTION

16.1.1 The construction and operation of the proposed wind turbine manufacturing facility has the potential to result in noise impacts on the surrounding environment. The key issues of interest are:

- Construction phase
 - Road traffic – arising from additional traffic associated with construction of the proposed scheme;
 - construction activities in particular, piling, which may result in nuisance issues at nearby sensitive receptors;
- Operational phase
 - Road traffic – arising from additional traffic associated with the operations of the proposed scheme, including transportation of materials and staff to and from site;
 - Shipping – the proposed development will increase shipping movements in the Humber Estuary, both associated with shipping in of materials, and the shipping out of completed turbines;
 - Manufacturing activities, external material and mobile equipment movements and associated site infrastructure has the potential to emit noise may result in nuisance issues at nearby sensitive receptors;
 - Wind turbine testing has the potential to cause noise emissions which may result in nuisance issues at nearby sensitive receptors;

16.2 RELEVANT POLICY AND LEGISLATIVE CONTEXT

OVERVIEW

16.2.1 Planning Policy Guidance PPG 24 Planning and Noise was introduced by the Department of the Environment in 1994. Paragraph 1 on page 1 of PPG 24 indicates that it was issued to:

'...provide advice on how the planning system can be used to minimise the adverse impact of noise without placing unreasonable restrictions on development or adding unduly to the costs and administrative burdens of business ... It outlines some of the main considerations which local planning authorities should take into account in drawing up development plan policies and when determining planning applications for development which will either generate noise or be exposed to existing noise sources.'

16.2.2 The noise assessment will be conducted in accordance with the following relevant standards, guidelines:

- BS 7445 Description and measurement of environmental noise;

- BS 4142:1997 Method for rating industrial noise affecting mixed residential and industrial area;
- BS 5228: Noise and vibration control on construction and open sites;
- ETSU-R-97 The Assessment and Rating of Noise from Wind Farms; and;
- Planning Policy Guidance Note PPG24: Planning and Noise, September 1994, DoE.

CONSTRUCTION NOISE

- 16.2.3 Noise levels generated by demolition and construction activities are regulated by guidelines and subject to local authority control. The Control of Pollution Act 1974 (CoPA, 1974) and Part III of the Environmental Protection Act 1990 (EPA, 1990) contain sections which can be applied to construction noise and vibration.
- 16.2.4 Advice is contained within British Standard BS 5228: 2009 noise and vibration control on construction and open sites. It contains a database on the noise emission from individual items of equipment, activities and routines to predict noise from demolition and construction methods to identified receptors. The prediction method gives guidance on the effects of different types of ground, and barrier attenuation and how to assess the impact of fixed and mobile plant.
- 16.2.5 In 1963 the Wilson Committee report on noise recommended that outside the windows (ie a “façade” noise level) of the nearest occupied dwelling in an urban area a noise level of 75 dB(A), and in suburban or rural areas a level of 70 dB(A), should not be exceeded by noise from construction work. This serves as a useful general guideline, but is not sufficiently definitive on whether the quoted levels can be exceeded at all, or whether a construction project taking one or two days should be treated differently from one taking one or two years or even longer.
- 16.2.6 The original British Standard Code of Practice on Noise Control on Construction and Demolition Sites (BS 5228: 1975, revised in 1997 and 2009) suggested noise reference levels for construction work based on the original Wilson Committee report recommendations but was more precise, recommending that generally at one metre outside the nearest noise sensitive building the equivalent continuous sound level over a 12-hour period (07.00 to 19.00 hours) should not exceed 75 dB(A). This gave some flexibility, allowing periods at a high level (exceeding 75 dB(A)) to be compensated by extended quieter periods. The suggested level was not mandatory and did not form part of the updated 1997 Standard.

16.2.7 Although the fixed noise levels of 70 dB(A) and 75 dB(A) re-appear in the 2009 standard, alternative methods for assessing the significance of construction noise, based on a relative change in noise levels, are also proposed:

“Noise levels generated by construction activities are deemed to be significant if the total noise (pre-construction ambient plus construction noise) exceeds the pre-construction ambient noise by 5dB or more, subject to lower cut-off values of 65 dB(A), 55 dB(A) and 45 dB(A) LAeq, Period, from construction noise alone, for the daytime, evening and night-time periods, respectively..”

CONSTRUCTION VIBRATION

16.2.8 Advice is contained within British Standard BS 5228: 2009 ‘noise and vibration control on construction and open sites’ and gives recommendations for basic methods of vibration control relating to construction and open sites where work activities/ operations generate significant vibration levels, including industry specific guidance.

16.2.9 The principal source of vibration during construction works relates to piling activities. The precise piling method to be used is yet to be confirmed. However, due to the relatively large distances between the site and the closest sensitive receptors, it is considered likely that even if driven piling is undertaken, resultant levels at the nearest sensitive receptors will not be significant.

SIGNIFICANT CONSTRUCTION ACTIVITIES

16.2.10 Significant noise generating construction activities are expected to be from sheet piling, piling, dredging operations. General construction activities such as fabrication and erection of the quay and associated activities would also be considered.

OPERATIONAL NOISE – FIXED INSTALLATION

16.2.11 BS 4142: 1997 1) method for rating noise affecting mixed residential and industrial areas’ details a method of assessing the acceptable noise from industrial sources by rating it against the existing background noise level, LA90, at the closest noise sensitive locations.

(1) BS 4142: 1997 ‘Method for rating industrial noise affecting mixed residential and industrial areas’.

- 16.2.12 In the case of a proposed new development, predicted L_{Aeq} noise levels are compared with the existing background noise level (L_{A90}). Additional penalties are applied, if appropriate, for noise of an impulsive or tonal nature resulting in the rating level. Assessment during the day time is based on a one hour duration, whilst for night time, a 5 minute period is used.
- 16.2.13 In Section 8 of BS 4142 'assessing the noise for complaint purposes' it is stated that an excess above the existing background noise level L_{A90} of up to 5 dB, due to noise from fixed plant at a new development, is of "marginal significance". Since the introduction of the Standard in 1967 it has been interpreted that a rating level 5 dB(A) above the background level due to a new, fixed plant noise source is, in general, acceptable. An excess of between 5 and 10 dB(A) falls into an intermediate area where local conditions may affect the likelihood of complaints arising (such as local perception of the development, the nature of the development, etc). An excess above the background noise level of greater than 10 dB(A) can be taken as a positive indication that complaints are likely. Similarly, a rating noise level from the new plant of 10 dB or more below the background L_{A90} is stated to be a positive indication that complaints are unlikely.
- 16.2.14 It is recognised that NLC has stated that, the rating level from the development would need to be at or below background level to be considered acceptable.
- 16.2.15 Additionally, the World Health Organisation (WHO) Guidelines for Community Noise will be taken into consideration in assessing and determining affects from noise from the development. (The WHO guideline values are organized according to specific environments and represent the sound pressure levels that affect the most exposed receiver within these specific environments. When multiple adverse health effects are identified for a given environment, the guideline values are set at the level of the lowest adverse health effect (the critical health effect). An adverse health effect of noise refers to any temporary or long-term deterioration in physical, psychological or social functioning that is associated with noise exposure- Suggested Additional Text)
- 16.2.16 Significant noise generating construction activities are expected to be from the manufacturing facilities themselves and their associated plant and infrastructure. Other potential noise sources including the use of mobile equipment associated with the movement and loading/unloading of materials and products onto and from ships, as well as general shipping related noise emissions.

OPERATIONAL NOISE – ROAD TRAFFIC

- 16.2.17 The Design Manual for Road and Bridges (DMRB) Volume 11 Section 3 Part 7 'Traffic Noise and Vibration' 2008 provides a method of evaluating both the immediate and long term impact of changes in the 18-hour traffic flow (06.00-24.00) in terms of the effects on people and, principally, occupiers of residential property.
- 16.2.18 Individuals vary widely in their response to traffic noise, although the average or community response from a large number of people to the same level of traffic noise is fairly stable. Consequently, a community average degree of annoyance can be related to the LA10,18hr traffic noise level. The annoyance caused by the existing traffic noise and the predicted future traffic noise is calculated, therefore, enabling the increase, or decrease in the percentage of people likely to be annoyed to be determined.
- 16.2.19 DMRB requires that an assessment is undertaken where an increase in a road traffic flow of 25% or greater is predicted (equivalent to an increase or decrease in road traffic noise of approximately 1 dB(A)), implying that road traffic flow increases of up to 25% offer no significant impact in environmental noise terms.
- 16.2.20 The recommended method for the calculation of noise from road traffic is given in 'Calculation of Road Traffic Noise', 1988 (CRTN) (1). CRTN is employed to calculate the LA10,18hr façade noise levels at sensitive receptors, based on traffic flow rate, percentage HGV, traffic speed and distance from the road to the receptor.

OPERATIONAL NOISE – WIND TURBINE TESTING

- 16.2.21 Operational wind turbine noise is typically assessed following the Department of Trade and Industry (DTI) Energy Technology Support Unit (ETSU) developed a guidance, ETSU-R-97 (2) developed for the assessment and rating of noise from wind farms. This recommends a methodology for measuring background noise and defining operational noise thresholds which can be used to identify significant adverse impacts. The ETSU Guidance is recommended by Planning Policy Statement 22 (PPS 22) (3) and its companion guide (4) as the appropriate method to assess operational wind turbine noise. Where

(1) The Department of Transport (1988) Calculation of Road Traffic Noise (CRTN).

(2) The Assessment and Rating of Noise from Wind Farms (ETSU-R-97), ETSU for the DTI, 1996.

(3) Planning Policy Statement 22: Renewable Energy. Office of the Deputy Prime Minister, 2004.

(4) Planning for Renewable Energy. A Companion Guide to PPS 22. Office of the Deputy Prime Minister, 2004.

predictions of noise emissions require it, background noise monitoring will be undertaken in accordance with the ETSU Guidance.

- 16.2.22 In consideration of the proposed development, the assessment of noise from the testing wind turbines would be guided by ETSU to determine impacts. The testing of wind turbines on the site has the potential to be a significant noise source. However, this potential will need to be determined as it is reliant on the testing regime, which at this point is not fully understood in terms of the time of day, how long testing is required to be conducted and how often.

16.3 *IDENTIFICATION OF SENSITIVE RECEPTORS*

OVERVIEW

- 16.3.1 A preliminary identification of potentially noise sensitive receptors has been undertaken from aerial photos, maps and from initial site visits and previous studies undertaken in the area.

POTENTIAL NOISE AND VIBRATION SENSITIVE HUMAN RECEPTORS

- 16.3.2 Noise sensitive receptors areas currently identified are:

- S1, (nearest) Station Street;
- S2, adjacent to Centrico Transport depot
- I1, Woodlands Ave, Immingham;
- SK1, Humber Rd, A160 South Killingholme;
- SK2, Staple Rd, South Killingholme;
- NK3, Clarkes Rd, North Killingholme;
- NK1, Nicholson Rd, North Killingholme;
- NK2, Farm, North Killingholme;
- NK4, Chase Hill Rd, North Killingholme;
- EH1, Dean St, East Halton (south);
- EH2, Chase Hill lane, East Halton Rd;
- EH3, Brick Lane East Halton;
- EH4, Scrub Lane East Halton;
- EH5, Swinster Lane East Halton;
- EH6, East Halton village centre;
- N1, unknown residence to north of site;
- E1 ,Eastern side of Humber River
- E2, Eastern side of Humber River

16.3.3 Representative receptor assessment locations are presented in *Drawing AME-09019*.

16.4 POTENTIAL NOISE AND VIBRATION SENSITIVE ECOLOGICAL RECEPTORS

OVERVIEW

16.4.1 The protection of sensitive ecological receptors, in this context, will be determined by the identification of species that are known to be sensitive to noise and vibration; either from airborne, ground borne or underwater transmission paths.

16.4.2 The assessment of impacts at sensitive ecological receptors need only be undertaken as specific ecological sites which are subject to statutory protection, these being Special Areas of Conservation (SACs), Special Protection Areas (SPAs), Ramsar sites and Sites of Special Scientific Interest (SSSIs).

16.4.3 A detailed review will be undertaken of all sensitive ecological sites in the vicinity of the various elements of the scheme with potential noise impacts, and where impacts are potentially significant, or sites are particularly sensitive to deposition, additional assessments may be required.

16.4.4 An initial review has identified that there are three (3) sensitive ecological receptors that are potentially impacted by the proposed development:

- the Humber Estuary SAC, SPA, Ramsar and SSSI
- Rosper Road Pools; and
- North Killingholme Haven Pits SSSI.

16.5 ASSESSMENT OF BASELINE CONDITIONS

OVERVIEW

16.5.1 To assess the potential noise impacts of the proposed development it is necessary to understand the existing baseline conditions. Existing baseline noise levels will be quantified through noise surveys of the area at the locations presented in *Drawing AME-01045*.

- S1 Station Road (East);

- S2 Station Road (location adjacent to transport depot, although to be confirmed if dwelling is residential occupation);
- S3 Marsh Lane (this location will be representative of ECO2 Rosper Road Pool);
- SK2 Staple Road, South Killingholme;
- NK 1 Nicholson Road, North Killingholme;
- EH5 Swinster Lane, East Halton; and
- ECO1 North Killingholme Haven Pits.

16.5.2 The baseline noise monitoring survey would consist of:

- Unattended continuous noise monitoring for a period that would provide at least 5 days of valid data inclusive of the weekend period; measuring LAeq, LAMax and a minimum LA90 and LA10 statistical noise parameters;
- Operator attended noise monitoring at representative receptor locations to quantify and characterise noise emissions from all noise sources in the area such as road traffic, industrial noise, rail, and shipping;
- Deployment of a meteorological station to measure wind speed data for the purpose of excluding noise measurements affected by periods of high winds and/or rain. Alternatively if an existing meteorological station within the area can be identified, it would be used;

16.5.3 A vital part of the baseline noise assessment is the quantification and understanding of the acoustic environment with particular focus on existing industrial noise, particularly during the night time period.

