APPENDIX 12-1

Construction Noise Assessment

A specialist energy consultancy

Appendix 12.1

Construction Noise Report

Killoshulan Wind Farm

Atlantic Infrastructure Renewables Ltd

IE00061-007-R1
20 October 2026

COMMERCIAL IN CONFIDENCE

tneigroup.com

Quality Assurance

TNEI Services Ltd, TNEI Africa (PTY) Ltd and TNEI Ireland Ltd operate an Integrated Management System and is registered with The British Assessment Bureau as being compliant with ISO 9001 (Quality), ISO 14001 (Environmental) and ISO 45001 (Health and Safety).

Disclaimer

This document is issued for the sole use of the Customer as detailed on the front page of this document to whom the document is addressed and who entered into a written agreement with TNEI. All other use of this document is strictly prohibited and no other person or entity is permitted to use this report unless it has otherwise been agreed in writing by TNEI. This document must be read in its entirety and statements made within may be based on assumptions or the best information available at the time of producing the document and these may be subject to material change with either actual amounts differing substantially from those used in this document or other assumptions changing significantly. TNEI hereby expressly disclaims any and all liability for the consequences of any such changes. TNEI also accept no liability or responsibility for the consequences of this document being relied upon or being used for anything other than the specific purpose for which it is intended, or containing any error or omission which is due to an error or omission in data used in the document that has been provided by a third party.

This document is protected by copyright and may only be reproduced and circulated in accordance with the Document Classification and associated conditions stipulated or referred to in this document and/or in TNEI's written agreement with the Customer. No part of this document may be disclosed in any public offering memorandum, prospectus or stock exchange listing, circular or announcement without the express and prior written consent of TNEI. A Document Classification permitting the Customer to redistribute this document shall not thereby imply that TNEI has any liability to any recipient other than the Customer.

Any information provided by third parties that is included in this report has not been independently verified by TNEI and as such TNEI accept no responsibility for its accuracy and completeness. The Customer should take appropriate steps to verify this information before placing any reliance on it.

Document Control

Revision	Status	Prepared by	Checked by	Approved by	Date
R1	CLIENT COMMENTS	FL	JB	JB	20/10/2026

TNEI Services Ltd
Company Registration Number: 03891836 **VAT Registration Number: 239 0146 20**

Registered Address 5th Floor 10 Chapel Walks, Manchester, M2 1HL Tel: +44 (0)161 233 4800	7th Floor West One Forth Banks Newcastle upon Tyne NE1 3PA Tel: +44 (0)191 211 1400	7th Floor 80 St. Vincent Street Glasgow G2 5UB Tel: +44 (0)141 428 3180

TNEI Ireland Ltd
Registered: 104 Lower Baggot Street, Dublin 2, DO2 Y940
Company Registration Number: 662195 **VAT Registration Number: 3662952IH**

Unit S12, Synergy Centre
TU Dublin Tallaght Campus
Tallaght
D24 A386
Tel: +353 (0)190 36445

TNEI Africa (Pty) Ltd
Registered: Mazars House, Rialto Rd, Grand Moorings Precinct,7441 Century City, South Africa
Company Number: 2016/088929/07

Unit 514 Tyger Lake
Niagara Rd & Tyger Falls Blvd
Bellville, Cape Town
South Africa, 7530

TNEI Inc.
Registered Address: 9319 Robert D/ Snyder Rd. PORTAL Building Mecklenburg County
Charlotte, NC 228223-0001 USA
Certification Number: C202305805696-1

Unit 216 PORTAL Building,
9319 Robert D. Snyder Road
Charlotte, Mecklenburg County,
North Carolina 28223
Tel: +1 (980) 245-4024

Executive Summary

TNEI Services Limited (TNEI) was commissioned by MKO on behalf of Killoshulan Renewable Energy Ltd, subsidiary of Atlantic Infrastructure Renewables Ltd. (AIR) ('the Applicant') to undertake predictions of noise levels associated with the Killoshulan Wind Farm, located in County Kilkenny. The noise predictions were used to assess the potential impact of noise attributable to the construction of the Proposed Project on the occupiers of nearby noise sensitive receptors.

The noise impact assessment was undertaken using guidance contained in BS 5228: Part 1 2009+A1:2014 *'Noise and vibration control on construction and open sites- Noise'* and the calculation methodology in *ISO 9613 2:2024 Acoustics – 'Attenuation of sound during propagation outdoors: Engineering method for the prediction of sound pressure levels outdoors'*, together with noise data for appropriate construction plant.

Predictions have been made at a selection of the identified noise sensitive receptors assuming that all items of plant were operating continually to provide a precautionary scenario. In addition, the noise model assumed that noise sources would be located within the most likely activity areas that are closest to the receptors, in reality plant would move around the site and only a proportion of the plant may be operating at any one time. As such, the predictions are likely to over-predict the actual sound levels experienced during the construction period.

The predicted noise levels for the construction activities of the Proposed Wind Farm are below the Category A Daytime Threshold Levels detailed within BS 5228:2009 for all receptors. If generators are left overnight at the construction compounds, predicted levels are also below the Category A Threshold Levels. Accordingly, construction noise impacts are below the indicator for a potential significant effect.

Predicted levels for Horizontal Directional Drilling activities for the Proposed 110kV Underground Cabling are also below the Category A Daytime Threshold Levels. For other activities associated with the Proposed 110kV Underground Cabling, such as trenching/backfill, or the construction of joint bays, levels may temporarily exceed the Category A Daytime Threshold Levels at receptors located directly adjacent to those activities. However, these works are also temporary in nature therefore no significant effects are predicted.

No significant effects resulting from construction noise are predicted, nevertheless, good practice during construction is recommended following guidance from BS 5228. If occasional work is undertaken outside of core hours, this shall be agreed in advance.

Contents

Document Control 3
Executive Summary 4
Contents 5
1 Introduction 7
1.1 Brief 7
1.2 Site Description 7
1.3 Project Description 8
2 Legislation, Policy and Guidance 11
2.1 Overview of Noise Planning Policy and Guidance 11
2.2 Relevant Guidance 11
3 Methodology 12
3.1 Considering the Potential for Noise Impacts 12
3.2 Study Area 12
3.3 Methodology for the Prediction of Noise 13
3.4 Limitations of the Noise Model 14
3.5 Methodology for the Assessment of Noise 14
3.6 Determining the Threshold Levels 16
4 Noise Impact Assessment 18
4.1 Modelling of Individual Sound Sources 18
4.1.1 Watercourse Crossings – Horizontal Directional Drilling (HDD) 18
4.2 Modelling of Construction Activities (On-Site) 19
4.2.1 Turbine Delivery Route Accommodation Areas 20
4.3 Proposed Grid Connection and HDD Activities 21
4.3.1 Watercourse Crossings – Horizontal Directional Drilling (HDD) 21
4.3.2 Joint Bays 22
4.3.3 Trenching and Backfill 22
4.3.4 Interaction of Proposed Grid Connection and Proposed Wind Farm Construction 23
5 Noise Mitigation Measures 24
6 Summary 26
7 References 27

TABLES

Table 1-1: Indicative Construction Timetable 10

Table 3-1: Construction Noise Assessment Locations 12
Table 3-2: Grid Connection Noise Assessment Locations 13
Table 3-3: Example of Threshold of Potential Significant Effect at Dwellings 16
Table 3-4: Typical Ambient Noise Levels, $L_{Aeq(t)}$ for each NML. 17
Table 4-1: Predicted CNAL Noise Immission Levels dB LAeq, t 20
Table 4-2: Predicted GNAL Noise Immission Levels dB LAeq,t 21

ANNEXES

Annex 1 – Figures

Annex 2 – Baseline Data

Annex 3 – Noise Model Data

Annex 4 – Results at Noise Sensitive Receptors (NSRs)

1 Introduction

1.1 Brief

TNEI was commissioned by MKO on behalf of Killoshulan Renewable Energy Ltd, subsidiary of Atlantic Infrastructure Renewables Ltd. (AIR) (the Applicant) to undertake a construction noise assessment for the Killoshulan Wind Farm (the Proposed Project). The following steps summarise the noise assessment process:

- Establish typical ambient noise levels at sensitive receptors located closest to the anticipated construction activities and derive appropriate noise threshold levels;
- Undertake predictions of activity noise throughout the construction period that would be incident at the nearest sensitive receptors;
- Compare the predicted noise levels across the construction period with the derived threshold values; and,
- Identify any requirements for mitigation measures, if needed.

The following terms and definitions are used throughout this report;

- **Emission** refers to the sound level emitted from a sound source, expressed as either a sound power level or a sound pressure level;
- **Immission** refers to the sound pressure level received at a specific location from a noise source(s);
- **SWL** indicates the sound power level in decibels (dB);
- **SPL** indicates the sound pressure level in decibels (dB);
- **NSR** (Noise Sensitive Receptor) are identified receptors that are sensitive to noise;
- **NML** (Noise Monitoring Location) refers to any location where baseline or specific noise levels have been measured;
- **CNAL** (Construction Noise Assessment Location) refers to any location associated with the Proposed Wind Farm and Proposed BESS and Proposed 110kV Substation where the construction noise immission levels are calculated and assessed; and,
- **GNAL** (Grid Connection Route Noise Assessment Location refers to any location associated with the Proposed 110kV Underground Cabling where the noise immission levels are calculated and assessed.

Unless otherwise stated, all noise levels refer to free field levels i.e. noise levels without influence from any nearby reflective surfaces. All coordinates refer to the Irish Transverse Mercator coordinate system.

For the purposes of this EIAR, the various project components are described and assessed using the following references: 'Proposed Project', 'the Site', 'Proposed Wind Farm', , 'Proposed Grid Connection'. Please see Section 1.1.1 of this EIAR for further details. A detailed description of the Proposed Project is provided in Chapter 4 of this EIAR, 'Description of the Proposed Project'.

1.2 Site Description

The Proposed Wind Farm is located approximately 2.4 km east of the village of Johnstown, 3.7 km northeast of the town of Urlingford and 4 km west of the village of Freshford, County Kilkenny. The area around the Proposed Wind Farm site is mainly rural, comprised of agricultural pastural land,

mixed forest/woodland, commercial forestry, and low-density residential land. The Proposed Grid Connection included the Proposed 110kV Underground Cabling and is approximately 12.6 km in length, originating from the Proposed 110 kV Substation and terminating at the existing Ballyragget 110 kV Substation, also in Co. Kilkenny.

The Proposed Wind Farm will be accessed via a single existing agricultural entrance off the R693 Regional Road.

Figure A1.1 shows the general site location, whilst Figure A1.2 details of the Proposed Project Layout, and site infrastructure.

1.3 Project Description

A detailed description of the Proposed Project and the construction requirements can be found in Chapter 4 of this EIAR.

Construction of the Proposed Wind Farm will require the establishment of two temporary construction compounds, the laying of tracks from the site entrance up to the construction compound and across the site to the wind turbine locations (10 no. wind turbines), excavation of turbine foundations, construction of turbine bases, delivery and erection of turbines, and the installation of a 110k substation and Battery Energy Storage Site (BESS).

A borrow pit may be opened onsite; no concrete batching will be undertaken onsite, instead only ready-mixed concrete sourced from local batching plants will be used.

With regards to the Proposed 110kV Underground Cabling, trenching and backfill activities will be required along the length of the cable route to facilitate laying of the electrical cabling, in addition there will be the requirement for joint bays to be established at regular intervals along the route.

There are six identified watercourse crossings along the Proposed 110kV Underground Cabling. The Proposed 110kV Underground Cabling will primarily seek to use culverts (construction methods to be employed at culvert/drain/service crossings are detailed in Section 4.8.2.6 of Chapter 4), however, if this is not suitable there will be a requirement for Horizontal Directional Drilling (HDD). This has been identified as being required at two of the watercourse crossings.

Construction works related to alterations in infrastructure of the local road network along the proposed turbine delivery route will be required to allow for delivery of the turbines. These are seen in the three small isolated EIAR Site Boundary areas to the southwest of the Proposed Wind Farm, in Figure A1.1. Each location is described in Section 4.4.3.1 of Chapter 4. The alterations required include the removal existing streetscape, trees, hedgerow vegetation, telecommunication poles/cabling, and field boundaries.

The construction period is anticipated to last for 24 months. Table 1-1 (overleaf), which presents an indicative construction timetable, is taken from Figure 4-36 of Chapter 4 of this EIAR and is also based on TNEIs experience of construction timetables for similar developments of this size and scale. Yellow coloured cells indicate construction activities that have been included in the construction noise assessment, whereas cells shaded grey indicate construction activities that would not typically generate high levels of noise, and as such are excluded from the assessment. These are further explained below:

- The upgrade/construction of access tracks from Q3 to Q6 would relate to low noise level activities such as the installation of drainage and water protection measures.
- The works post-construction of the Proposed 110kV Substation and Proposed BESS (which is assumed to take place from Q6) would relate to low noise level activities, e.g. activities associated with cabling and electrical works.

- The ‘site landscaping’ during Q4 to Q6 would relate to low noise level activities associated with installation of gates, signs, the removal of temporary offices etc.
- The ‘commissioning tests’ of the turbines during Q6 to Q8 for the final three quarters would relate to low level noise activities associated with testing the operation of the wind turbines, substation and BESS, and undertaking inspection of all equipment prior to energising the wind farm.

Construction activities will be limited to core hours between 07:00 and 19:00 on weekdays and 07:00-13:00 on Saturdays. Typically, there will be no working outside of core hours, however it should be noted that out of necessity some activity outside of the core hours could arise, including delivery and unloading of abnormal loads, turbine components, health and safety requirements, to ensure optimal use is made of fair-weather windows (e.g. for concrete deliveries, and the erection of turbine blades / erection and dismantling of cranes). No working shall usually be undertaken outside of core hours without prior agreement with the relevant Local Authority.

No night-time construction activities (outside of the potential activities above) are expected, however, there may be requirement to run a small amount of fixed plant during the night-time, for example to provide power to site cabins or provide lighting for health and safety reasons. The assessment, therefore, considers the potential for night-time noise impacts.

Table 1-1: Indicative Construction Timetable

Construction Activity	Quarter							
	1	2	3	4	5	6	7	8
Grid Connection								
Felling								
Junction/Site Entrance Upgrades								
Site Compounds								
Upgrade/Construction of Access Tracks								
Operation of Borrow Pits								
Turbine Hardstands								
Turbine Foundations								
Erection of Turbines								
Site Landscaping								
Substation & BESS Construction/Electrical Works								
Commissioning Tests								

2 Legislation, Policy and Guidance

2.1 Overview of Noise Planning Policy and Guidance

There is no published statutory Irish guidance that contains suggested noise limits for construction activities, other than a 2014 document published by the National Roads Authority (NRA), which relates to noise from road developments only. The Association of Acoustic Consultants of Ireland, however, have published Environmental Noise Guidance for Local Authority Planning & Enforcement Departments (1), which states; *"The chief guidance document applied in the assessment of construction phase noise impacts is British Standard BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites Part 1: Noise (2014)."* The assessment has therefore been undertaken in accordance with this standard, hereafter simply referred to as BS 5228.

2.2 Relevant Guidance

Part 1 of BS 5228 provides useful guidance on practical noise control and management, including recommendations for basic methods of noise control, including sections on community relations, training, occupational noise effects, neighbourhood nuisance and project supervision. The annexes provide information on typical construction noise sources, noise calculation procedures, mitigation measures and their effectiveness.

3 Methodology

3.1 Considering the Potential for Noise Impacts

Noise levels from construction activities would vary continually over time as activities and plant start, stop and move around the Site. To assess the potential impacts of construction noise, a series of worst-case scenarios can be considered where construction plant and activities are assumed to be working continually and in locations closest to the nearest sensitive receptors.

In the case of mobile plant, this can be modelled as a point source that moves along a defined path, or as a line source. Both approaches effectively average out the sound power level across the length of the line, rather than concentrating it in a single location next to the receptor. In such cases, the predicted noise level will represent an average level expected to be received for most of the activity period.

In general, the overall noise level attributable to construction activities from the Site will tend to be higher in the assessment than what would actually occur for the majority of the time, given that all plant is assumed to be operating continually and concurrently.

3.2 Study Area

Noise Sensitive Receptors (NSRs) are properties, people or fauna that are sensitive to noise and, therefore, may require protection from nearby noise sources. The Study Area for the construction noise assessment is defined through the identification of the closest NSRs to the Proposed Wind Farm (within c. 2 km of the Proposed Wind Farm), on the assumption that if noise levels are acceptable at the closest receptors, then they should also be acceptable at more distant locations. With regards to the Proposed 110kV Underground Cabling, further NSRs require consideration to assess noise associated with proposed Horizontal Directional Drilling (HDD) works, which will be located several kilometres from the Site to the north, as this has the potential to be more disruptive (due to both noise level and time required to complete works) in comparison to other activities associated with the Proposed 110kV Underground Cabling. Figure 1.1 (Annex 1) details the location of the nearest identified NSRs to the Site and those assessed as part of the Proposed 110kV Underground Cabling HDD works.

A sample of Construction Noise Assessment Locations (CNALs) have been chosen to represent the closest residential NSRs or group of residential NSRs to the anticipated construction activities for the Proposed Wind Farm and for the Proposed BESS and Proposed 110kV Substation. Table 3-1 details the CNALs considered within the assessment, which are also shown on Figure A1.2 (Annex 1), along with the site infrastructure.

Table 3-1: Construction Noise Assessment Locations

CNAL	Coordinates		Associated Dwellings List Number
	ITM X	ITM Y	
CNAL1	632856	666845	NSR210
CNAL2	633644	667794	NSR245
CNAL3	635112	667755	NSR305

CNAL	Coordinates		Associated Dwellings List Number
	ITM X	ITM Y	
CNAL4	636156	667868	NSR369
CNAL5	636632	664404	NSR397
CNAL6	634820	665204	NSR510

Similarly, a sample of Grid Connection Noise Assessment Locations (GNALs) have been chosen to represent the closest NSR or group of NSRs to the anticipated HDD activities for the Proposed 110kV Underground Cabling to the north of the Proposed Wind Farm site, Table 3-2 details the GNALs considered within the assessment, which are also shown on Figure A1.3 (Annex 1).

Table 3-2: Grid Connection Noise Assessment Locations

GNAL	ITM X	ITM Y
GNAL1	642044	671877
GNAL2	642201	671877
GNAL3	642219	671864
GNAL4	643500	671899
GNAL5	644484	672090

3.3 Methodology for the Prediction of Noise

To predict the noise immission levels attributable to the construction of the Proposed Project, a noise propagation model has been produced using the propriety noise modelling software CadnaA. Within the software, complex models can be used to simulate the propagation of noise according to a range of international calculation standards, including BS 5228 and *ISO 9613-2:2024 Acoustics - Attenuation of sound during propagation outdoors: General method of calculation*.

For this assessment, noise modelling was undertaken using the ISO 9613 propagation model, which was chosen in preference to the calculation method presented in BS 5228, primarily because of some of the significant distances from source to receptor evident on this site. Specifically, BS 5228 notes in F 2.2.2.2, that at distances over 300 m noise predictions using the BS 5228 methodology should be treated with caution, especially where a soft ground correction factor has been applied, because of the increasing importance of meteorological effects; whereas ISO 9613-2 provides equations that have been validated up to greater distances.

The model uses the octave band sound power output of the proposed construction plant as its acoustic input data, and calculates on an octave band basis, attenuation due to geometric spreading, atmospheric absorption, topography and barriers and ground effects.

For the purposes of this assessment, all noise level predictions have been undertaken using a receiver height of 1.5 m above local ground level. Soft ground (G=1) attenuation has been assumed at all locations except for construction compound, turbine bases and similar areas of hardstanding, which have been modelled with a ground attenuation of G=0 (hard ground).

Air absorption based on a temperature of 10°C and 70 % relative humidity has been assumed.

3.4 Limitations of the Noise Model

The noise propagation models are intended to give a good approximation of the construction noise level and the contribution of each individual noise source. However, it is expected that actual levels are unlikely to be matched exactly with modelled values and the following limitations in the model should be considered:

- In accordance with ISO 9613-2, all assessment locations are modelled as downwind of all noise sources and propagation calculations are based on a moderate ground-based temperature inversion, such as commonly occurs at night;
- The predicted barrier attenuation provided by local topography, embankments, walls, buildings and other structures in the intervening ground between source and receiver has not been accounted for to provide a cautious assessment of predicted noise effects;
- Unless specifically stated, the modelled scenarios assume all noise sources are operating continuously and simultaneously, estimating a worst-case noise level; and,
- For mobile HGV plant where traffic count data was available, e.g. lorries, tracked excavators, dumpers, mobile cranes, etc, these have been modelled as moving point sources along their anticipated movement paths;
- If traffic count data was not available for mobile plant, e.g. forestry activities, then these sources have been modelled as line sources (where the sound power level of the source is effectively averaged out across the length of the entire line);
- Both of these approaches to mobile plant will give an approximation of the overall noise levels from mobile plant at receptor locations; in reality noise levels would fluctuate as construction plant and activities move around in their areas of activity.

3.5 Methodology for the Assessment of Noise

The construction noise assessment is undertaken as follows:

- Define CNALs/GNALs to represent the closest NSRs to construction activity;
- Identify applicable Threshold Levels to identify potentially significant effects;
- Predict noise levels for various construction activities or phases at each CNAL, in addition to predicted noise levels for HDD works at each GNAL;
- Compare the predicted levels and duration of exposure to the BS 5228 Threshold Levels; and
- Where necessary, develop suitable mitigation measures to minimise any significant adverse effects.

Annex E, part E.3.2 of BS 5228-1, provides example methods for assessing the significance of construction noise effects and gives examples of acceptable limits for construction noise.

Table E.1 of BS 5228-1 (represented here as Table 6.4.3) contains an example of the significance criteria that can be used to assess construction noise for residential receptors.

Three categories of thresholds are provided for varying time periods. The appropriate category for any given receptor can be chosen after quantifying the existing ambient noise levels (rounded to the nearest 5 dB) at that location. BS 5228 provides the following advice regarding the thresholds:

- *"Note 1: A potential significant effect is indicated if the LAeq,T noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level.*
- *Note 2: If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total LAeq,T noise level for the period increases by more than 3 dB due to site noise.*
- *Note 3: Applied to residential receptors only."*

Therefore, the assessment of construction noise reflects a specific noise threshold for the locality for a particular period of the day, rather than an absolute noise level.

Table 3-3: Example of Threshold of Potential Significant Effect at Dwellings

Assessment Category and Threshold Value Period	Threshold Value $L_{Aeq,T}$ dB		
	Category A(A)	Category B(B)	Category C(C)
Night-Time (23:00 – 07:00)	45	50	55
Evenings and Weekends(D)	55	60	65
Daytime (07:00 – 19:00) & Saturdays (07:00 to 13:00)	65	70	75

(A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values;

(B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as category A values;

(C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than category A values;

(D) 19:00-23:00 weekdays, 13:00-23:00 Saturdays and 07:00 – 23:00 Sundays.

It should be noted that exceedance of the threshold does not in itself indicate a significant effect, rather, the standard states; *"If the site noise level exceeds the appropriate category value, then a potential significant effect is indicated. The assessor then needs to consider other project-specific factors, such as the number of receptors affected and the duration and character of the impact, to determine if there is a significant effect".*

3.6 Determining the Threshold Levels

A baseline noise survey was undertaken as part of the Proposed Project's operational noise assessment, as detailed in Appendix 12-2.

Data from six Noise Monitoring Locations (NMLs) has been used to set the appropriate BS 5228 threshold levels. The NMLs can be seen on Figure 1.1 (Annex 1).

Table 3-4 details the average $L_{Aeq(t)}$ noise level at each NML, after filtering for rainfall events and windspeeds of 5 m/s and above[1]. The levels were calculated for each of the periods defined in BS 5228 for weekday and weekend daytime, evening and night-time.

Annex 2 includes a table of the measured noise levels at all NMLs for all assessment periods, which were used to calculate the levels detailed in Table 3-4.

[1] It should be noted that the windspeed was sourced as part of the operational noise survey for the Proposed Wind Farm, which references wind speed at standardised 10 m height (see TA12-2 for further detail). Whilst wind speed would usually be measured at the height of the sound level meter microphone, it is considered that standardised 10 m height would result in higher wind speed occurrence and is therefore a more conservative assessment method.

Table 3-4: Typical Ambient Noise Levels, $L_{Aeq(t)}$ for each NML.

Noise Monitoring Location	Daytime M - F	Daytime Sat	Evenings	Weekend	Night-time
	Weekdays 07:00 - 19:00	Saturday 07:00 - 13:00	Weekdays 19:00 - 23:00	Saturday 13:00 – 23:00 Sunday 07:00 to 23:00	All days 23:00 - 07:00
NML1	46	43	34	41	30
NML2	44	44	36	46	31
NML3	40	41	32	36	32
NML4	37	34	29	35	27
NML5	39	44	36	38	30
NML6	43	38	33	38	30

With due regard to the ambient noise levels at NSRs around the Proposed Wind Farm, the BS 5228 Category A threshold levels have been adopted for all receptors and during all periods. These represent the most stringent threshold levels in BS 5228.

Given the core construction hours and Category A Threshold values, the assessment has been made against a threshold level of 65 dB LAeq(t) for Daytime Weekdays (07:00 – 19:00) and Saturday (07:00 – 13:00), at all CNALs/GNALs.

The Category A Threshold Values have also been adopted for the assessment of the GNALs for the Proposed 110kV Underground Cabling. It is noted that the ambient LAeq(t) values at these NMLs, which are generally situated close to the Proposed Wind Farm site, may not be representative of the ambient levels at all NSRs proximate to the Proposed 110kV Underground Cabling. However, as the measured LAeq(t) values result in the most stringent Category A Threshold Values being used, their application as part of the Proposed 110kV Underground Cabling assessment would be considered worst case.

4 Noise Impact Assessment

4.1 Modelling of Individual Sound Sources

Noise immission levels would vary throughout the construction period as construction activities, plant and locations vary. For much of the working day the noise associated with construction activities would be less than predicted, as the assessment assumes all equipment is operating continually at full power and in locations closest to the NSRs, whereas in practice, equipment load, and precise location may vary throughout the day. This approach has been adopted to represent a worst-case assessment.

At this stage a detailed plant list is not available, therefore, a generic plant list based upon experience of similar projects has been used. All modelled noise sources and associated sound power level (SWL) and sound pressure level (SPL) data is included in Annex 3 – Noise Model Data.

For tree felling activities, broadband noise level data for a harvester, a forwarder and a skidder has been taken from *Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment* (2) (Forestry Commission). No octave band data is available, therefore modelling has been undertaken using the 500 Hz octave band data, as recommended in ISO 9613. Noise levels for the Harvester and Forwarder are given at the operator position inside a Q Cab. To estimate external levels, 10 dB has been added to the quoted levels and the sound power level for each item of plant has been calculated in CadnaA assuming the quoted sound pressure levels (SPLs) have been measured at a distance of 1 m.

For all other construction activities, source noise level data was taken from Annex C of BS 5228, which provides octave band sound pressure levels for a wide variety of construction plant and activities suitable for the estimation of noise immission levels.

Construction noise sources for any given activity will generally comprise a mix of both moving and static sources. Mobile sources include mobile construction plant and Heavy Goods Vehicles (HGVs), while static construction plant could include piling rigs and pumps. Static equipment is usually located at a fixed location for an extended period of time.

For both mobile and static plant, activity noise levels would be transient in nature due to changes in location, on/off periods, and fluctuations of load on any individual machine.

All static plant and activities have been modelled as single point sources. All mobile plant (excavators, dozers, dumpers etc.) have been modelled as either a line or moving point source along their anticipated movement paths, or as a stationary point source located at the closest point of its anticipated work area to any given CNAL.

4.1.1 Watercourse Crossings – Horizontal Directional Drilling (HDD)

For the HDD activities associated with the grid connection, typically the use of multiple items of plant is required, including pumps, mud recyclers, drilling rigs and generators, however, due to the relatively small size of the watercourses, the plant is anticipated to be a Vermeer D36 x 50 Directional Drill (or similar), which is much smaller than many DD rigs and requires less associated plant. Additionally, for small crossings, the work would likely be completed within 1 to 2 weeks, and is considered a short-term activity.

Broadband data has been provided by the manufacturer, which has been supplemented with spectral data for an engine taken form Table 11.22 of *'Engineering Noise Control'* (Bies and Hansen) (3). For each watercourse where there is requirement for HDD, a Vermeer HDD rig, and two tracked excavators have been modelled as stationary point sources, located at the closest point of its anticipated work area to any given GNAL on each side of the river.

4.2 Modelling of Construction Activities (On-Site)

Noise propagation modelling has been undertaken considering the key activities that are likely to occur throughout the construction period. This is based on the indicative information detailed in this report and presented in Chapter 4 of this EIAR.

Noise modelling has been undertaken for Q1 to Q7 only (when the main construction activities are likely to occur), an additional modelling scenario has been included to consider the night-time. The modelled scenarios represent the following construction activities; details of the items of plant included in each modelled scenario, as well as the noise data for each modelled noise source, are included in Table A3.1 of Annex 3):

- **Q1 – Q2**: Site establishment commences with construction of the two temporary construction compounds (TCCs). The junctions at the main site entrance as well as the northern entrance are upgraded. Forestry felling is performed throughout the Proposed Wind Farm site and around the proposed turbine locations. Access tracks are constructed/upgraded within the Proposed Wind Farm site. The borrow pit becomes operational with materials being distributed to the temporary construction compounds. Construction of the Substation and BESS compound begins in Q2.
- **Q3 – Q5:** Operation at the temporary construction compounds and borrow pit continues (activity at the borrow pit ceases in Q5). Construction of turbine hardstanding and foundations commences. Turbine erection commences in Q4 with the delivery of components and cranes and subsequent turbine erection. T4, T5, T6, T7, and the MET mast are erected in Q5.
- **Q6 – Q7:** Operation at the TCCs continues until Q7 where the temporary construction compounds are decommissioned. The final turbines, T8, T9, and T10 are erected in Q6.
- **Night-time Scenario:** Generators and lights operational at all temporary construction compounds.

The construction noise impact results accounting for the above, are summarised in Table 4-1 below. In addition, noise level predictions for identified NSRs in the Study Area for the Proposed Wind Farm only, are provided in Annex 4 for completeness. Predictions at the NSRs associated with the Proposed Grid Connection are not included since all Proposed 110kV Underground Cabling NSRs will have lower predicted levels than those predicted at the GNALs.

Table 4-1: Predicted CNAL Noise Immission Levels dB LAeq, t

CNAL	Daytime Quarterly Predictions (dB)							
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Night-time: Q1-Q8
CNAL1	42	40	45	42	43	33	24	13
CNAL2	43	43	43	44	41	38	33	23
CNAL3	47	53	51	52	51	44	44	33
CNAL4	40	61	41	42	41	38	33	22
CNAL5	62	56	61	58	61	58	33	22
CNAL6	42	42	42	43	42	40	33	24

The results summarised in Table 4-1 above show that the predicted construction noise levels during core hours are below the Daytime Category A Threshold Levels of 65 dB at all assessment scenarios (Q1-Q7).

The predicted levels are near the Daytime Threshold Levels at CNAL5 from Q1 to Q6. During Q1 the level is a result of the proximity of CNAL5 to the road junction/access track upgrades occurring at the Site entrance on the R693. At the closest points these works will occur approx. 35 m away from CNAL5. As construction progresses following the junction/access upgrades, works will move away from CNAL5; it is anticipated that the highest levels of noise will be experienced for, at most, only a small number of days. During Q2 to Q6, these predicted levels are the result of the various site deliveries accessing the site via the main site entrance. Given that site deliveries are transient in nature the impact from these works is likely to be less than predicted.

There are no construction works planned during the Evening and Weekend, or Night-Time periods, however, there may be some static plant operating overnight such as generators for lighting the compounds. Predicted night-time noise levels from such potential activity are below the Night-time Category A Threshold Level of 45dB at all CNALs.

Accordingly, construction noise impacts are below the indicator for a likely significant effect. However, mitigation in the form of good practice during construction is recommended to keep noise to a minimum and recommendations in accordance with BS 5228 are discussed in Section 5.

4.2.1 Turbine Delivery Route Accommodation Areas

There are several NSRs in close proximity to the accommodation areas and noise from proposed activities could have the potential at times to exceed the guideline levels. However, it should be noted that this will be a short-term, non-continuous, and temporary impact (the total duration for all accommodation areas will be 27 days over a 6-week period) and significant effects are therefore not anticipated. Once complete, the roads/vegetation/street furniture will be reinstated following delivery of the turbines. Good practice during construction is recommended and will reduce noise levels from these short-term works to minimum levels.

4.3 Proposed Grid Connection and HDD Activities

The Proposed 110kV Underground Cabling is anticipated to take approximately 15 months to complete. As with the Proposed Wind Farm, normal daytime working hours will be implemented. No construction work is planned during the Evening, Night-Time and Weekend periods.

4.3.1 Watercourse Crossings – Horizontal Directional Drilling (HDD)

There are two locations identified as requiring HDD;

- Location 1 – Stone arch bridge, Ballyconra (approx. ITM 642163, 671835): rural in nature with four residential properties within 100 m of the HDD location.
- Location 2 – River Nore (approx. ITM 643936, 671895): located off the N77 National Road. Approximately 200 m away from the Tirlán Ballyragget Food Manufacturing premises. The closest cluster of residential receptors is approximately 450 m to the west of the HDD location, followed by a cluster of properties approx. 600 m to the east.

GNALs 1-3, as identified in Table 3-2, are located near to HDD Location 1, and GNALs 4 and 5 are the nearest NSRs to HDD Location 2. The watercourses for which HDD is required are shown on Figure 1.3 between each group of GNALs.

Each HDD location is anticipated to take up to two weeks to complete and therefore nearby NSRs may be subject to noise during working hours for the duration of this period. Machinery that would be associated with establishing tracks, construction of launch and receiver pits and HDD primarily includes excavators and an HDD machine. All associated plant will be contained within the launch and receiver pits temporarily established at each location.

It is anticipated that only one set of HDD machinery will be required and that it will move in succession between each HDD location, only occurring at one location at a time. The modelled construction scenario assumes that launch and receiver pits are being established concurrently at both identified locations and is therefore a worst-case scenario.

The predicted noise immission levels for the identified GNALs is shown in Table 4-2 below.

Table 4-2: Predicted GNAL Noise Immission Levels dB LAeq,t

GNAL	HDD Predictions (dB)
GNAL1	56
GNAL2	64
GNAL3	63
GNAL4	44
GNAL5	40

The immission levels resulting from both modelled HDD construction activities meet the 65 dB(A) BS 5228 Daytime Threshold values. Again, mitigation in the form of good practice during construction is recommended to keep noise to a minimum. No construction works are planned during the Evening, Night-Time and Weekend periods.

4.3.2 Joint Bays

Seventeen joint bays will be established at regular intervals along the Proposed 110kV Underground Cabling. The estimated duration is expected to take less than one week per jointing bay (including pulling the cable between each joint bay) and so any effect would be temporary in nature. Construction of joint bays will require an excavator and dumper, in addition to operators of hand tools. There may be a requirement for water to be pumped out of the joint bays in the event of heavy rainfall, and an area of hardstanding may be established for the siting of temporary equipment.

Calculations using data from BS 5228 for the jointing bay plant listed above indicates that noise levels would be below the 65 dB Category A Daytime Threshold from a distance of approx. 50 m. Six of the seventeen joint bay locations have a residential property close to, or within 50 m of the joint bay location.

For these receptors, noise levels will exceed the BS 5228 Category A Daytime Threshold levels for the duration of the activities at each per location. However, given that these effects are temporary, these effects would not be considered significant in terms of BS 5228. No jointing bay works will take place during the Evening, Night-Time and Weekend Periods.

Given the potential for occasional daytime exceedances at some of the NSRs located within 50 m of joint bays along the Proposed 110kV Underground Cabling, noise mitigation measures shall be carefully considered in line with the guidance presented in BS 5228 to lessen the impact. Use of water pumps shall only be considered during the daytime period and not be left running during the night-time. Other mitigation measures include the erection of temporary boarding alongside the drilling rig or use of 'acoustic blanket panels' to hang from temporary fencing ('Heras' or similar). This should be installed as close to the plant as is practicable and fitted to interrupt any direct line of site to the closest receptors. Examples of appropriate products include Echo Noise Defender and Soundex DeciBloc. Further good-practice construction mitigation measures in accordance with BS 5228 are discussed below in Section 5.

It should be noted that GNAL1 is one of the residential properties located within 50 m of a joint bay location, where the levels will likely be above 65 dB. This joint bay location can be seen in Figure A1.3. GNALs 2 and 3 are also located within 200 m of this joint bay. Therefore, if the HDD activities near GNAL1, 2, and 3 are conducted concurrently with the joint bay activities, the total predicted levels will exceed the Category A Daytime Threshold at GNAL1 and bring the predicted levels to be at or just below the Threshold at GNAL2 and GNAL3. Therefore, to minimise noise, the works at this joint bay shall be scheduled to avoid being at the same time as the HDD works adjacent.

Due to proximity of receptors to jointing bay and HDD careful consideration shall be given to scheduling. Appropriate timetabling and mitigation measures shall be included within the CEMP.

4.3.3 Trenching and Backfill

For the Proposed 110kV Underground Cabling, the amount of required plant is relatively small, typically being based around an excavator for trenching and backfill activities. As such, construction activities in any one location will be limited in duration and adverse noise effects are anticipated to be negligible. Section 4.8.2 in Chapter 4 of the EIAR describes the construction of the Proposed 110kV Underground Cabling in more detail.

Where construction activities occur directly besides a dwelling the noise levels at that location are likely to be in the region of 75 – 80 dBA for a short period of time. This noise level is deemed representative of any receptor that lies adjacent to the 12.6 km Proposed 110kV Underground Cabling. It should be noted, however, that this would only occur where construction activities are directly opposite a dwelling i.e. within approximately 20 m. To put this into context, trenching and backfill activities are anticipated to move along the underground electrical cabling route at

approximately 150 m to 300 m a day, therefore, the length of time when construction activities will be occurring adjacent to any given receptor is likely to be for a few hours. For the majority of the time, plant and equipment will be located at greater distances and noise levels will be lower.

Although noise levels from trenching and backfill operations may occasionally exceed the BS 5228 threshold levels during the daytime, this would only occur for a short period of time at any one location. Accordingly, the impact is not deemed significant.

4.3.4 Interaction of Proposed Grid Connection and Proposed Wind Farm Construction

Construction of the Proposed Grid Connection and Proposed Wind Farm is anticipated to commence at a similar time, as per the indicative timetable in Table 1-1. It has been assumed that works on the Proposed 110kV Underground Cabling will begin from within the Proposed Wind Farm site and then progress east towards Ballyragget along the route. Inclusion of the joint bays in the construction noise model does not materially affect the conclusion of Section 4.2. It is assumed that by Q2 and onwards, the Proposed 110kV Underground Cabling works will have progressed sufficiently far away from the Proposed Wind Farm such that any cumulative effects are negligible (given the assumptions of the rate of trenching and backfill and duration at each joint bay).

The two HDD locations are both located near the termination of the Proposed 110kV Underground Cabling (located approx. 10 km away from the Proposed Wind Farm) thus any contribution from the Proposed Wind Farm or vice versa will also be negligible at this location.

5 Noise Mitigation Measures

No significant effects resulting from construction noise are predicted. Nevertheless, a range of good practice measures shall be employed to minimise noise impacts.

The hours for the proposed works shall be limited to core construction hours 07:00 to 19:00 on weekdays and 07:00-13:00 on Saturdays. There shall be no working on Sundays and Public Holidays, however, it should be noted that out of necessity some activity outside of the core hours could arise, from delivery and unloading of abnormal loads for health and safety requirements, or to ensure optimal use is made of fair-weather windows for concrete deliveries, the removal and erection of turbine blades and the erection and dismantling of cranes. If occasional work is undertaken outside of core hours, especially during construction of access tracks at the site entrance, this shall be agreed with the Local Authority in advance.

Good site practices for construction of the Proposed Wind Farm and Proposed Grid Connection shall be implemented to minimise the likely effects. Particular care shall be taken at the joint bay locations along the Proposed 110kV Underground Cabling. Section 8 of BS 5228-1:2009+A1:2014 recommends a number of simple control measures as summarised below that can be employed onsite. These measured are outlined, along with some taken from TNEI's experience, below:

- Keep local residents informed of the proposed working schedule, where appropriate, including the times and duration of any abnormally noisy activity that may cause concern.
- Ensure that any extraordinary site work taking place outside of standard working hours (for example, crane operations lifting components onto the tower) shall be programmed, when appropriate, so that haulage vehicles shall not arrive at or leave the site outside of core hours or other specific delivery hours, with the exception of abnormal loads that would be scheduled to avoid significant traffic flows.
- Ensure all vehicles and mechanical plant shall be fitted with effective exhaust silencers and be subject to programmed maintenance.
- Select inherently quiet plant where appropriate - all major compressors shall be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which shall be kept closed whenever the machines are in use.
- Ensure all ancillary pneumatic percussive tools shall be fitted with mufflers or silencers of the type recommended by the manufacturers.
- Instruct that machines shall be shut down between work periods or throttled down to a minimum.
- Regularly maintain all equipment used on site, including maintenance related to noise emissions.
- Vehicles shall be loaded carefully to ensure minimal drop heights so as to minimise noise during this operation.
- Ensure all ancillary plant such as generators and pumps shall be positioned so as to cause minimum noise disturbance and if necessary, temporary acoustic screens or enclosures shall be provided.
- At any location within 50m of a residential receptor, where joint bay activities are required for the Proposed Grid Connection, the installation of temporary boarding alongside the excavation plant or 'acoustic blanket panels' hanging from heras fencing (or similar) may be considered.

- The same mitigation measures above shall also be considered as part of any HDD activity to reduce noise exposure at the GNALs.
- If water pumps are being used for the joint bay or HDD activities, they shall not be left operating overnight.

6 Summary

A noise impact assessment was undertaken to consider the construction of the Proposed Wind Farm and Proposed Grid Connection. The guidance used was largely contained in BS 5228: Part 1 2009+A1:2014 *'Noise and vibration control on construction and open sites- Noise'*, specifically the *'ABC method'* example method of Annex E which defines potential thresholds depending on existing noise levels at local residential receptors.

Noise propagation modelling has been undertaken in the CadnaA noise modelling software in accordance with ISO 9613-2:2024. The anticipated noise immission levels are presented for scenarios likely to occur throughout the construction period of the Proposed Wind Farm and Proposed Grid Connection. The modelled scenarios consider a representative selection of activities throughout the indicative construction timetable. The modelling assumes that the construction activities are occurring at locations within the development site that are closest to the noise sensitive receptors.

Six residential receptors neighbouring the Proposed Wind Farm (not including the Proposed 110kV Underground Cabling) were identified as the nearest Noise Sensitive Receptors to the Proposed Wind Farm construction activities. These are termed Construction Noise Assessment Locations (CNALs)

The predicted levels are below the Category A Daytime Threshold Levels, as detailed within BS 5228, during the proposed core hours of work (Mon-Fri 07:00 to 19:00 and Saturday 07:00 to 13:00. Any activities to be undertaken outside these periods will require agreement with the relevant Local Authority. If generators were to be left operating overnight at the construction compounds, predicted levels will also be below the Category A Threshold Levels. Accordingly, construction noise impacts for the Proposed Wind Farm are below the indicator for a potential significant effect.

During trenching and backfill construction activities for the Proposed 110kV Underground Cabling, there will be short periods of time where noise levels may exceed the BS 5228 threshold levels, however, this will only occur when associated activities occur directly adjacent to a residential property. The BS 5228 thresholds may also be exceeded temporarily for six receptors which are located within 50 m of jointing bay activities for the Proposed 110kV Underground Cabling. For these receptors, temporary noise barriers, or similar, can be considered to reduce noise levels at the nearest dwellings and best practice mitigation measures shall be employed in line with recommendations made in BS 5228. The duration of such activities at any given receptor is anticipated to be short/temporary, thus no significant impacts are anticipated. Horizontal Directional Drilling (HDD) activities are required for two watercourse crossings, and the predicted levels are below the Category A Daytime Threshold Levels for the nearest identified receptors. A small number of receptors are located near to a joint bay as well as one of the HDD locations. The HDD and joint bay activities shall not be undertaken simultaneously as this would likely result in exceedances of the Threshold Levels. The result of the construction noise assessment for the Proposed Grid Connection indicates that following the adoption of appropriate mitigation and good practice measures, no significant effects from construction noise are anticipated at any NSRs.

No significant effects resulting from construction noise are predicted, nevertheless, good practice during construction is recommended following guidance from BS 5228. If occasional work is undertaken outside of core hours, this shall be agreed in advance with the Local Authority.

7 References

1. **Ireland, Association of Acoustic Consultants of.** *Association of Acoustic Consultants of Ireland.* [Online] 2021. [Cited: 06 June 2024.] http://aaci.ie/wp-content/uploads/2022/07/Noise-Guidelines-for-Local-Authorities-v1.pdf.

2. **Forestry Commission.** *Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment.* Edinburgh : The Crown, 2003.

3. **Bies, David A and Hansen, Colin H.** *Engineer Noise Control.* 4. s.l. : Spon Press, 2009. p. 597.

4. **The Scottish Government.** *Planning Advice Note: Planning and Noise.* s.l. : The Crown, 2011. PAN 1/2011.

5. —. *Technical Advice Note: Assessment of Noise.* s.l. : The Crown, 2011. TAN 1/2011.

6. **British Standards Institute.** *Noise and Vibration Control on Construction and Open Sites. Code of Practice for Basic Information and Procedures for Noise and Vibration Control.* s.l. : BSI, 1997. BS 5228:1997-Parts 1-5.

7. **(ISO), International Organisation for Standardisation.** *Acoustics – Attenuation of Sound During Propagation Outdoors: Part 2: Engineering method for the prediction of sound pressure levels outdoors.* Geneva : ISO, 2024. ISO 9613-2:2024.

8. **UK Government.** Control of Pollution Act 1974. *legislation.gov.uk.* [Online] [Cited: 21 4 2025.] https://www.legislation.gov.uk/ukpga/1974/40/contents.

9. —. The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015. *legislation.gov.uk.* [Online] [Cited: 25 4 2025.] https://www.legislation.gov.uk/uksi/2015/227.

10. **British Standards Institute.** *5228 Part 2: Code of practice for noise and vibration control on construction and open sites. Vibration.* UK : BSI, 2014. BS 5228-2:2009+A1:2014.

11. —. *5228 Part 1: Code of Practice for Noise and Vibration Control on Construction and Open Sites. Noise.* s.l. : BSI, 2014. BS 5228:2009 +A1:2014.

12. **Ministry of Housing, Communities and Local Government.** National Planning Policy Framework (NPPF). *gov.uk.* [Online] [Cited: 25 4 25.] https://www.gov.uk/guidance/national-planning-policy-framework.

13. **Department for Envionment, Food and Rural Affairs DEFRA.** *Noise Policy Statement for England (NPSE).* UK : The Crown, 2010.

Annex 1 – Figures

- Figure 1.1 – Study Area
- Figure 1.2 – Construction Noise Assessment Locations
- Figure 1.3 – Grid Connection Noise Assessment Locations

N

NML1

NML2

NML3

NML4

NML5

NML6

0 1 2 3 Kilometre

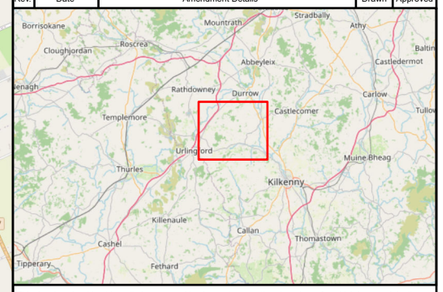
LEGEND

- EIAR Site Boundary
- Killoshulan Wind Farm
- Noise Monitoring Locations (NMLs)

Noise Sensitive Receptors Represented By:

- NML1
- NML2
- NML3
- NML4
- NML5
- NML6
- Non-Residential
- Proposed Grid Connection Route NSRs for HDD Activities

Rev.	Date	Amendment Details	Drawn	Approved
0	09/10/2026	FIRST ISSUE	FL	JB



This drawing should not be relied on or used in circumstances other than those for which it was originally prepared and for which TNEI Services Ltd was commissioned. TNEI Services Ltd accepts no responsibility for this drawing to any party other than the person by whom it was commissioned. Any party which breaches the provisions of this disclaimer shall indemnify TNEI Services Ltd for all loss or damage arising therefrom.

tnei

Client: MKO

Drawing Status: FOR INFORMATION

Project Title: KILLOSHULAN WIND FARM

Drawing Title: FIGURE A1.1 - STUDY AREA

Scale: 1:50,000 | Size: A3 | Spatial Reference: IRENET95 Irish Transverse Mercator

Drawing Number: IE00061-008

© OpenStreetMap (and) contributors, CC-BY-SA

N

CNAL1
CNAL2
CNAL3
CNAL4
CNAL5
CNAL6
NML1
NML2
NML3
NML4
NML5
NML6
T1
T2
T3
T4
T5
T6
T7
T8
T9
T10

Kilometre
0
1
2
3

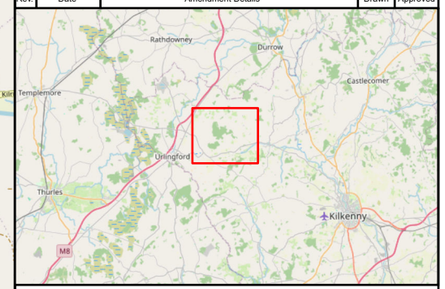
LEGEND

- Construction Noise Assessment Locations (CNALs)
- EIAR Site Boundary
- Met Mast
- Noise Monitoring Locations (NMLs)

Noise Sensitive Receptors (NSRs) Represented By:

- NML1
- NML2
- NML3
- NML4
- NML5
- NML6
- Non-Residential
- Proposed New Roads
- Upgrades to Existing Roads
- Turbine Hardstands
- Onsite Substation & BESS Compound
- Temporary Construction Compounds
- Borrow Pits

Rev.	Date	Amendment Details	Drawn	Approved
0	08/10/2026	FIRST ISSUE	FL	JB



This drawing should not be relied on or used in circumstances other than those for which it was originally prepared and for which TNEI Services Ltd was commissioned. TNEI Services Ltd accepts no responsibility for this drawing to any party other than the person by whom it was commissioned. Any party which breaches the provisions of this disclaimer shall indemnify TNEI Services Ltd for all loss or damage arising therefrom.

tnei

Client: MKO

Drawing Status: FOR INFORMATION

Project Title: KILLOSHULAN WIND FARM

Drawing Title: FIGURE A1.2 - CONSTRUCTION NOISE ASSESSMENT LOCATIONS

Scale:	Size:	Spatial Reference:
1:25,000	A3	IRENET95 Irish Transverse Mercator

Drawing Number: IE00061-009

© OpenStreetMap (and) contributors, CC-BY-SA

N

GNAL1

GNAL2

GNAL3

GNAL4

GNAL5

Kilometre

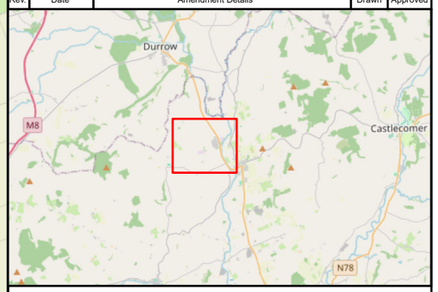
0 0.5 1 1.5

© OpenStreetMap (and) contributors, CC-BY-SA

LEGEND

- EIAR Site Boundary
- Grid Connection Noise Assessment Locations (GNALs)
- Noise Sensitive Receptors (NSRs)
- Horizontal Directional Drilling (HDD) Locations
- Joint Bay Locations
- Proposed Grid Connection Route

Rev.	Date	Amendment Details	Drawn	Approved
0	17/08/2026	FIRST ISSUE	FL	JB



This drawing should not be relied on or used in circumstances other than those for which it was originally prepared and for which TNEI Services Ltd was commissioned. TNEI Services Ltd accepts no responsibility for this drawing to any party other than the person by whom it was commissioned. Any party which breaches the provisions of this disclaimer shall indemnify TNEI Services Ltd for all loss or damage arising therefrom.

tnei

Client: MKO

Drawing Status: FOR INFORMATION

Project Title: KILLOSHULAN WIND FARM

Drawing Title: FIGURE A1.3 - GRID CONNECTION NOISE ASSESSMENT LOCATIONS

Scale:	Size:	Spatial Reference:
1:10,000	A3	IRENET95 Irish Transverse Mercator

Drawing Number: IE00061-010

Annex 2 – Baseline Data

- Table A2.1 – Ambient Sound Levels

NML01	Measured Sound Pressure Level (Filtered) dB LAeq (t)									
Assessment Period	Daytime $_{M-F}$		Daytime $_{Sat}$		Evenings		Weekend		Night-time	
	Weekdays 07:00 - 19:00		Saturday 07:00 - 13:00		Weekdays 19:00 - 23:00		Saturday 13:00 – 23:00 & Sunday 07:00 to 23:00		All days 23:00 - 07:00	
	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*
09/12/2022	36.5	10			35.8	60			35.3	10
10/12/2022			43.2	10			33.2	10		
11/12/2022							40.7	20		
12/12/2022	48.5	30							32.5	20
13/12/2022										
14/12/2022										
15/12/2022	45.1	10			34.7	10			32.3	20
16/12/2022	38.6	30							33.6	40
17/12/2022							40.8	40		
18/12/2022										
19/12/2022										
20/12/2022										
21/12/2022									30.2	10
22/12/2022										
23/12/2022					37.5	10				
24/12/2022										
25/12/2022										
26/12/2022					32.9	10			30.9	50
27/12/2022										
28/12/2022										
29/12/2022										
30/12/2022									27.7	10
31/12/2022			42.5	10			39	20		
01/01/2023							42.4	50	28.5	10
02/01/2023	44.5	30								
03/01/2023										
04/01/2023										
05/01/2023										
06/01/2023	44.7	20							28.2	20
07/01/2023										
08/01/2023										
09/01/2023					35.7	10				
10/01/2023									30.5	10
11/01/2023										
12/01/2023										
13/01/2023	44.9	10								
14/01/2023										
15/01/2023							45.3	50	33.4	10
16/01/2023	46.5	20			23.7	10			26.9	40
17/01/2023	41.7	30								
18/01/2023	46.8	10							28.2	20
19/01/2023									35.1	10
20/01/2023	50	40			35.9	10			28.5	10
21/01/2023			47.7	10					27.6	10
22/01/2023							38.1	20		
23/01/2023					31.7	10				
24/01/2023	60.2	30								
25/01/2023										
26/01/2023	44.3	20							28.3	70
27/01/2023	46.7	70			33.7	10				
28/01/2023			40.2	10			47	10	26.6	10
Mean of Valid Periods (dBA)	**46**		**43**		**34**		**41**		**30**	

NML02	Measured Sound Pressure Level (Filtered) dB LAeq (t)									
Assessment Period	Daytime $_{M-F}$		Daytime $_{Sat}$		Evenings		Weekend		Night-time	
	Weekdays 07:00 - 19:00		Saturday 07:00 - 13:00		Weekdays 19:00 - 23:00		Saturday 13:00 – 23:00 & Sunday 07:00 to 23:00		All days 23:00 - 07:00	
	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*
09/12/2022	39.1	10			35.9	60			34.1	10
10/12/2022			43.5	10			42.4	10		
11/12/2022							42.5	20		
12/12/2022	44.3	30							28.1	20
13/12/2022										
14/12/2022										
15/12/2022	43.6	10			37.3	10			35.9	20
16/12/2022	43.7	30							32.5	40
17/12/2022							43	40		
18/12/2022										
19/12/2022										
20/12/2022										
21/12/2022									32.8	10
22/12/2022										
23/12/2022					36.8	10				
24/12/2022										
25/12/2022										
26/12/2022					31.5	10			31.7	50
27/12/2022										
28/12/2022										
29/12/2022										
30/12/2022									23.7	10
31/12/2022			42.8	10			54.4	20		
01/01/2023							41.2	50	28.7	10
02/01/2023	44.6	30								
03/01/2023										
04/01/2023										
05/01/2023										
06/01/2023	43.5	20							27.4	20
07/01/2023										
08/01/2023										
09/01/2023					36.5	10				
10/01/2023									34.1	10
11/01/2023										
12/01/2023										
13/01/2023	44.9	10								
14/01/2023										
15/01/2023							41.4	50	35.8	10
16/01/2023	43.2	20			24.4	10			28.9	40
17/01/2023	42.2	30								
18/01/2023	41.7	10							31.7	20
19/01/2023									25.9	10
20/01/2023	45	40			43.1	10			36.8	10
21/01/2023			46.4	10					34.5	10
22/01/2023							56.9	20		
23/01/2023					35.4	10				
24/01/2023	48.9	30								
25/01/2023										
26/01/2023	47.3	20							27.5	70
27/01/2023	47.2	70			39.5	10				
28/01/2023			42.5	10			43	10	30.6	10
Mean of Valid Periods (dBA)	**44**		**44**		**36**		**46**		**31**	

NML03	Measured Sound Pressure Level (Filtered) dB LAeq (t)									
Assessment Period	Daytime $_{M-F}$		Daytime $_{Sat}$		Evenings		Weekend		Night-time	
	Weekdays 07:00 - 19:00		Saturday 07:00 - 13:00		Weekdays 19:00 - 23:00		Saturday 13:00 – 23:00 & Sunday 07:00 to 23:00		All days 23:00 - 07:00	
	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*
09/12/2022	43.4	10			32.7	60			33.3	10
10/12/2022			37.5	10			32.6	10		
11/12/2022							34	20		
12/12/2022	35.2	30							31.8	20
13/12/2022										
14/12/2022										
15/12/2022	36.1	10			31.7	10			30.2	20
16/12/2022	36.7	30							35.5	40
17/12/2022							40.5	40		
18/12/2022										
19/12/2022										
20/12/2022										
21/12/2022									33	10
22/12/2022										
23/12/2022					39.4	10				
24/12/2022										
25/12/2022										
26/12/2022					32.9	10			35.1	50
27/12/2022										
28/12/2022										
29/12/2022										
30/12/2022									19.4	10
31/12/2022			38.9	10			50.5	20		
01/01/2023							31	50	31.1	10
02/01/2023	43.2	30								
03/01/2023										
04/01/2023										
05/01/2023										
06/01/2023	43.8	20							25.8	20
07/01/2023										
08/01/2023										
09/01/2023					35.1	10				
10/01/2023									41.4	10
11/01/2023										
12/01/2023										
13/01/2023	43.3	10								
14/01/2023										
15/01/2023							32.5	50	32	10
16/01/2023	42.4	20			21.3	10			22.8	40
17/01/2023	42.1	30								
18/01/2023	38.2	10							28.4	20
19/01/2023									22.9	10
20/01/2023	39.8	40			39.5	10			43.2	10
21/01/2023			46.4	10					44.4	10
22/01/2023							40.2	20		
23/01/2023					28.3	10				
24/01/2023	40	30								
25/01/2023										
26/01/2023	36.4	20							28.5	70
27/01/2023	35.6	70			29.6	10				
28/01/2023			39.7	10			29.5	10	29.4	10
Mean of Valid Periods (dBA)	**40**		**41**		**32**		**36**		**32**	

NML04	Measured Sound Pressure Level (Filtered) dB LAeq (t)									
Assessment Period	Daytime $_{M-F}$		Daytime $_{Sat}$		Evenings		Weekend		Night-time	
	Weekdays 07:00 - 19:00		Saturday 07:00 - 13:00		Weekdays 19:00 - 23:00		Saturday 13:00 – 23:00 & Sunday 07:00 to 23:00		All days 23:00 - 07:00	
	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*
09/12/2022	35.5	10			30.6	60			27.8	10
10/12/2022			34.3	10			28.4	10		
11/12/2022							28	20		
12/12/2022	45.1	30							26.5	20
13/12/2022										
14/12/2022										
15/12/2022	32.2	10			29.5	10			30.3	20
16/12/2022	39.2	30							27.7	40
17/12/2022							50.8	40		
18/12/2022										
19/12/2022										
20/12/2022										
21/12/2022									27.3	10
22/12/2022										
23/12/2022					30.3	10				
24/12/2022										
25/12/2022										
26/12/2022					28	10			26.8	50
27/12/2022										
28/12/2022										
29/12/2022										
30/12/2022									25	10
31/12/2022			32.3	10			37.5	20		
01/01/2023							38.4	50	27.5	10
02/01/2023	36.3	30								
03/01/2023										
04/01/2023										
05/01/2023										
06/01/2023	34.6	20							23.2	20
07/01/2023										
08/01/2023										
09/01/2023					30.7	10				
10/01/2023									31.7	10
11/01/2023										
12/01/2023										
13/01/2023	39.1	10								
14/01/2023										
15/01/2023							33.5	50	32.4	10
16/01/2023	31.2	20			27.7	10			29.4	40
17/01/2023	36.8	30								
18/01/2023	36.9	10							25.7	20
19/01/2023									26.3	10
20/01/2023	42.4	40			29.8	10			24.5	10
21/01/2023			35.7	10					26.5	10
22/01/2023							31.4	20		
23/01/2023					23.7	10				
24/01/2023	35.8	30								
25/01/2023										
26/01/2023	35.4	20							24.6	70
27/01/2023	36.9	70			26.9	10				
28/01/2023			34.6	10			34.3	10	26.4	10
Mean of Valid Periods (dBA)	**37**		**34**		**29**		**35**		**27**	

NML05	Measured Sound Pressure Level (Filtered) dB LAeq (t)									
Assessment Period	Daytime $_{M-F}$		Daytime $_{Sat}$		Evenings		Weekend		Night-time	
	Weekdays 07:00 - 19:00		Saturday 07:00 - 13:00		Weekdays 19:00 - 23:00		Saturday 13:00 – 23:00 & Sunday 07:00 to 23:00		All days 23:00 - 07:00	
	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*
09/12/2022	33.8	10			28.7	60			26.3	10
10/12/2022			43.4	10			35.4	10		
11/12/2022							34.7	20		
12/12/2022	46.2	30							30.9	20
13/12/2022										
14/12/2022										
15/12/2022	35	10			42.5	10			25.2	20
16/12/2022	35.6	30							32.4	40
17/12/2022							40	40		
18/12/2022										
19/12/2022										
20/12/2022										
21/12/2022									25.5	10
22/12/2022										
23/12/2022					35.3	10				
24/12/2022										
25/12/2022										
26/12/2022					32.9	10			41.9	50
27/12/2022										
28/12/2022										
29/12/2022										
30/12/2022									28.4	10
31/12/2022			44.4	10			35.2	20		
01/01/2023							30.6	50	26.4	10
02/01/2023	38.4	30								
03/01/2023										
04/01/2023										
05/01/2023										
06/01/2023	39.9	20							32.3	20
07/01/2023										
08/01/2023										
09/01/2023					34	10				
10/01/2023									32.1	10
11/01/2023										
12/01/2023										
13/01/2023	39	10								
14/01/2023										
15/01/2023							37.1	50	30.1	10
16/01/2023	41.3	20			42	10			26.2	40
17/01/2023	34.2	30								
18/01/2023	34	10							28.3	20
19/01/2023									29.9	10
20/01/2023	44	40			42.9	10			31.3	10
21/01/2023			46.1	10					33.9	10
22/01/2023							41.2	20		
23/01/2023					31.6	10				
24/01/2023	47.6	30								
25/01/2023										
26/01/2023	36.1	20							28.1	70
27/01/2023	45.6	70			31.7	10				
28/01/2023			43.4	10			50.7	10	25.8	10
Mean of Valid Periods (dBA)	**39**		**44**		**36**		**38**		**30**	

NML06	Measured Sound Pressure Level (Filtered) dB LAeq (t)									
Assessment Period	Daytime $_{M-F}$		Daytime $_{Sat}$		Evenings		Weekend		Night-time	
	Weekdays 07:00 - 19:00		Saturday 07:00 - 13:00		Weekdays 19:00 - 23:00		Saturday 13:00 – 23:00 & Sunday 07:00 to 23:00		All days 23:00 - 07:00	
	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*	LAeq	*t (min)*
09/12/2022	32.3	10			31	60			30	10
10/12/2022			35.2	10			24	10		
11/12/2022							34.6	20		
12/12/2022	37	30							40.7	20
13/12/2022										
14/12/2022										
15/12/2022	32.7	10			33	10			34.6	20
16/12/2022	39.7	30							31.8	40
17/12/2022							51.4	40		
18/12/2022										
19/12/2022										
20/12/2022										
21/12/2022									27.7	10
22/12/2022										
23/12/2022					37.4	10				
24/12/2022										
25/12/2022										
26/12/2022					33.1	10			32.4	50
27/12/2022										
28/12/2022										
29/12/2022										
30/12/2022									24.5	10
31/12/2022			40.2	10			36.2	20		
01/01/2023							32	50	29.6	10
02/01/2023	37.1	30								
03/01/2023										
04/01/2023										
05/01/2023										
06/01/2023	56.1	20							29.1	20
07/01/2023										
08/01/2023										
09/01/2023					37.7	10				
10/01/2023									30	10
11/01/2023										
12/01/2023										
13/01/2023	58.7	10								
14/01/2023										
15/01/2023							34.2	50	31.4	10
16/01/2023	59.2	20			30.4	10			28.1	40
17/01/2023	40.1	30								
18/01/2023	35.7	10							29.3	20
19/01/2023									24	10
20/01/2023	39.6	40			27.8	10			27.4	10
21/01/2023			38.3	10					28.1	10
22/01/2023							38.1	20		
23/01/2023					33.8	10				
24/01/2023	47.3	30								
25/01/2023										
26/01/2023	37.2	20							30.3	70
27/01/2023	45.5	70			34.5	10				
28/01/2023			38.8	10			49.5	10	25.2	10
Mean of Valid Periods (dBA)	**43**		**38**		**33**		**38**		**30**	

Annex 3 – Noise Model Data

- Table A3.1 – Noise Modelling Data breakdown by month
- Table A3.2 – Sound Power Level Data

Table A3.1

Scenario & Activity Description	Plant	Data Source	Location	No.
Quarter 1				
Road junction upgrades - Moving Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller, Road lorry (full)	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	Main site entrance	1
Construction of TCC - Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	Both TCCs	2
Operation of TCC - Point Source	Diesel generator, Diesel generator-lights, Wheeled Excavator	BS5228 ref C4.84, C4.86, C.4.10 respectively	Both TCCs	2
Upgrade of Access track – Moving Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	From the main site entrance up towards T1 and then to T7 as well as the track going from T10 to T8	3
Forestry Felling – Line Source	Forwarder, Harvester, Skidder	TNEI Library	Felling around the site access tracks and locations of all turbines	5
Borrow pit in operation – Point Source	Excavator mounted rock breaker, Tracked semi-mobile crusher, Dumper, Dozer, Tracked Excavator, Diesel water pump (surface water)	BS5228 ref C9.12, C9.15, C4.3, C2.12, C2.14, C11.1 respectively	Borrow Pit	1
Transport of materials - Moving Point Source	Dumper	BS5228 ref C4.3	Both operational borrow pits to respective TCCs	2
Deliveries - Moving Point Source	Road lorry (full)	BS 5228 ref C6.21	Along R693 to each TCC	2
Joint Bays - Point Source	Dumper. Diesel generator, Tracked Excavator, Disel water pump	BS 5228 ref C4.3, C4.86, C2.14, C11.1 respectively	At the three joint bays located within the Wind Farm site	3
Quarter 2				
Road junction upgrades - Moving Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	Northern entrance	1
Upgrade of Access track – Moving Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	Near the northern entrance	1
Deliveries - Moving Point Source	Road lorry (full)	BS 5228 ref C6.21	Along R693 to each TCC	2
Borrow pit in operation – Point Source	Excavator mounted rock breaker, Tracked semi-mobile crusher, Dumper, Dozer, Tracked Excavator, Diesel water pump (surface water)	BS5228 ref C9.12, C9.15, C4.3, C2.12, C2.14, C11.1 respectively	Borrow pit	1
Transport of materials - Moving Point Source	Dumper	BS5228 ref C4.3	Borrow pit to both TCCs	2
Construction of turbine hardstanding – Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	T1, T2, T3	3
Construction of Substation/BESS – Point Source	Concrete mixer truck + truck mounted concrete pump + boom arm, Tracked Excavator, Vibratory roller, Dozer, Dumper	BS 5228 ref C4.32, C2.14, C5.20, C2.12, C4.3 respectively	At the Substation/BESS site	2
Operation of TCC - Point Source	Diesel generator, Diesel generator-lights, Wheeled Excavator	BS5228 ref C4.84, C4.86, C.4.10 respectively	Both TCCs	2
Quarter 3				
Deliveries - Moving Point Source	Road lorry (full)	BS 5228 ref C6.21	Along R693 to each TCC	2
Borrow pit in operation – Point Source	Excavator mounted rock breaker, Tracked semi-mobile crusher, Dumper, Dozer, Tracked Excavator, Diesel water pump (surface water)	BS5228 ref C9.12, C9.15, C4.3, C2.12, C2.14, C11.1 respectively	Borrow pit	1
Transport of materials - Moving Point Source	Dumper	BS5228 ref C4.3	Borrow pit to both TCCs	2
Operation of TCC - Point Source	Diesel generator, Diesel generator-lights, Wheeled Excavator	BS5228 ref C4.84, C4.86, C.4.10 respectively	Both TCCs	2

Table A3.1

Scenario & Activity Description	Plant	Data Source	Location	No.
Construction of turbine hardstanding – Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	T4, T5, T6, T7, and MET mast	4
Construction of turbine foundations – Point Source	Concrete mixer truck + truck mounted concrete pump + boom arm x2, Dumper	BS 5228 ref C4.32, C4.3 respectively	T1, T2, T3	3
Concrete Delivery – Moving Point Source	Concrete mixer truck x 2	BS 5228 ref C4.20	Along R693 to southern TCC	1
Concrete Delivery Trucks Idling – Point Source	Concrete pump + concrete mixer truck (idling) x2	BS 5228 ref C4.26	At southern TCC	1
Construction of Substation/BESS – Point Source	Concrete mixer truck + truck mounted concrete pump + boom arm, Tracked Excavator, Vibratory roller, Dozer, Dumper	BS 5228 ref C4.32, C2.14, C5.20, C2.12, C4.3 respectively	At the Substation/BESS site	2
Quarter 4				
Deliveries - Moving Point Source	Road lorry (full)	BS 5228 ref C6.21	Along R693 to each TCC	2
Borrow pit in operation – Point Source	Excavator mounted rock breaker, Tracked semi-mobile crusher, Dumper, Dozer, Tracked Excavator, Diesel water pump (surface water)	BS5228 ref C9.12, C9.15, C4.3, C2.12, C2.14, C11.1 respectively	Borrow pit	1
Transport of materials - Moving Point Source	Dumper	BS5228 ref C4.3	Borrow pit to both TCCs	2
Operation of TCC - Point Source	Diesel generator, Diesel generator-lights, Wheeled Excavator	BS5228 ref C4.84, C4.86, C.4.10 respectively	Both TCCs	2
Construction of turbine hardstanding – Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	T8, T9, T10	3
Construction of turbine foundations – Point Source	Concrete mixer truck + truck mounted concrete pump + boom arm x2, Dumper	BS 5228 ref C4.32, C4.3 respectively	T4, T5, T6, T7	4
Concrete Delivery – Moving Point Source	Concrete mixer truck x 2	BS 5228 ref C4.20	Along R693 to southern TCC	1
Concrete Delivery Trucks Idling – Point Source	Concrete pump + concrete mixer truck (idling) x2	BS 5228 ref C4.26	At southern TCC	1
Erection of turbines – Point Source	Mobile Telescopic Crane x2	BS 5228 ref C4.45	T1, T2, T3	3
Construction of Substation/BESS – Point Source	Concrete mixer truck + truck mounted concrete pump + boom arm, Tracked Excavator, Vibratory roller, Dozer, Dumper	BS 5228 ref C4.32, C2.14, C5.20, C2.12, C4.3 respectively	At the Substation/BESS site	2
Delivery of Cranes and Turbine Components – Moving Point Source	Mobile Telescopic Crane x2, Road Lorry (full)	BS 5228 ref C4.45 and C6.21 respectively	Along R693 to the southern TCC	1
Quarter 5				
Deliveries - Moving Point Source	Road lorry (full)	BS 5228 ref C6.21	Along R693 to each TCC	2
Operation of TCC - Point Source	Diesel generator, Diesel generator-lights, Wheeled Excavator	BS5228 ref C4.84, C4.86, C.4.10 respectively	Both TCCs	2
Construction of turbine foundations – Point Source	Concrete mixer truck + truck mounted concrete pump + boom arm x2, Dumper	BS 5228 ref C4.32, C4.3 respectively	T8, T9, T10	3
Concrete Delivery – Moving Point Source	Concrete mixer truck x 2	BS 5228 ref C4.20	Along R693 to northern TCC	1
Concrete Delivery Trucks Idling – Point Source	Concrete pump + concrete mixer truck (idling) x2	BS 5228 ref C4.26	At northern TCC	1
Erection of turbines – Point Source	Mobile Telescopic Crane x2	BS 5228 ref C4.45	T4, T5, T6, T7, and MET mast	5

Table A3.1

Scenario & Activity Description	Plant	Data Source	Location	No.
Construction of Substation/BESS – Point Source	Concrete mixer truck + truck mounted concrete pump + boom arm, Tracked Excavator, Vibratory roller, Dozer, Dumper	BS 5228 ref C4.32, C2.14, C5.20, C2.12, C4.3 respectively	At the Substation/BESS site	2
Delivery of Cranes and Turbine Components – Moving Point Source	Mobile Telescopic Crane x2, Road Lorry (full)	BS 5228 ref C4.45 and C6.21 respectively	Along R693 to southern TCC	1
Quarter 6				
Deliveries - Moving Point Source	Road lorry (full)	BS 5228 ref C6.21	Along R693 to each TCC	2
Operation of TCC - Point Source	Diesel generator, Diesel generator-lights, Wheeled Excavator	BS5228 ref C4.84, C4.86, C.4.10 respectively	Both TCCs	2
Erection of turbines – Point Source	Mobile Telescopic Crane x2	BS 5228 ref C4.45	T8, T9, T10	3
Delivery of Cranes and Turbine Components – Moving Point Source	Mobile Telescopic Crane x2, Road Lorry (full)	BS 5228 ref C4.45 and C6.21 respectively	Along R693 to northern TCC	1
Quarter 7				
Operation of TCC - Point Source	Diesel generator, Diesel generator-lights, Wheeled Excavator	BS5228 ref C4.84, C4.86, C.4.10 respectively	Both TCCs	2
Decommissioning of TCC - Point Source	Dumper, Dozer, Tracked Excavator, Vibratory roller	BS 5228 ref C4.3, C2.12, C2.14, C5.20 respectively	Both TCCs	2
Night				
Generators at TCCs – Point Source	Diesel generator, Diesel generator-lights	BS5228 ref C4.84, C4.86 respectively	Both TCCs	2

Table A3.2

Name	Octave Band Centre Frequency (Hz) & Sound Power Level (dB)										Source
	63	125	250	500	1000	2000	4000	8000	A	Linear	
Tracked Excavator	113	106	105	105	101	99	96	91	107	115	BS 5228 C2. 14
Dumper	112	109	102	101	100	96	89	81	104	115	BS 5228 C4. 3
Dozer	113	102	104	101	100	106	90	84	109	115	BS 5228 C2. 12
Concrete mixer truck + truck mounted concrete pump + boom arm	101	101	105	104	100	98	93	90	106	110	BS 5228 C4. 32
Mixing concrete: Concrete mixer truck	111	102	94	97	98	106	88	83		108	BS 5228 C4. 20
Concrete pump + concrete mixer truck (idling)	103	104	99	98	99	96	92	88	103	109	BS 5228 C4. 26
Mobile telescopic crane	118	109	106	102	105	104	97	89	109	119	BS 5228 C4. 45
Diesel generator	103	100	104	98	97	93	84	75	102	108	BS 5228 C4. 84
Diesel generator - lights	106	99	94	90	87	83	84	77	94	107	BS 5228 C4. 86
Vibratory roller	118	110	101	100	98	93	87	82	103	119	BS 5228 C5. 20
Excavator mounted rock breaker	119	117	113	117	115	115	112	108	121	125	BS 5228 C9. 12
Tracked semi-mobile crusher	119	119	116	115	113	111	106	96	118	124	BS 5228 C9. 15
Water pump (diesel)	109	111	105	103	104	103	97	91	109	115	BS 5228 C11.1
Road Lorry (full)	124	110	102	101	105	100	99	92		109	BS 5228 C6.21
Wheeled Excavator	92	88	91	92	90	85	79	73	94	98	BS 5228 C4. 10

Table A3.2

Name	Octave Band Centre Frequency (Hz) & Sound Power Level (dB)										Source
	63	125	250	500	1000	2000	4000	8000	A	Linear	
HDD	82	89	89	88	90	89	83	76	102	104	Vermeer D36x50 II Risk Assessment (broadband dBA value), and Table 11.22 of Engineering Control (Bies, Hansen) (spectral data)
Harvester				103					103		Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment
Forwarder				101					101		Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment
Skidder				108					108		Noise Hazards in Forestry Operations and Selection of Personal Protective Equipment

Annex 4 – Results at Noise Sensitive Receptors

- Table A4.1 – Noise Sensitive Receptor Results

Table A4.1

NSR	Eircode	ITM X	ITM Y	Noise Immission Level, dB LAeq(t)							
				Q1	Q2	Q3	Q4	Q5	Q6	Q7	NIGHT
150	E41 WR88	631713	667762	35	34	36	35	34	30	23	12
153	E41 PV38	631762	667694	35	35	36	35	35	31	24	13
156	E41 H520	631779	666427	36	36	37	36	36	30	24	13
157	E41 E028	631807	667996	35	34	36	35	34	30	24	13
159	E41 P9X2	631831	667684	35	35	37	36	35	31	24	13
167	E41 X2V3	631910	667817	35	35	37	36	35	31	24	13
168	E41 AY19	631915	667964	35	35	36	36	35	31	24	13
170	E41 HK03	631952	665535	35	35	36	36	34	30	23	12
172	E41 KP20	631974	666374	37	37	38	37	36	31	24	14
174	E41 DF85	632010	668360	34	34	36	35	34	30	24	13
176	E41 RP40	632058	666463	38	37	39	38	37	31	25	14
186	E41 YW70	632187	666468	38	38	39	38	38	32	25	14
187	E41 EY10	632234	666702	39	38	40	39	38	32	25	15
191	E41 E522	632272	667236	38	38	39	38	37	32	25	14
192	E41 TD65	632278	667192	38	38	40	38	37	32	25	15
193	E41 WF22	632285	667088	38	38	40	39	38	32	25	14
198	E41 XE00	632366	666444	39	38	40	39	38	32	25	15
202	E41 RX54	632512	666583	39	38	41	39	39	32	25	15
203	E41 N925	632614	666963	40	39	41	40	39	32	24	13
207	E41 VY31	632749	666725	40	39	42	40	40	32	24	13
210	E41 C3K8	632843	666846	42	40	45	42	43	33	24	14
244	E41 KT18	633658	668944	36	37	37	37	36	33	26	16
245	E41 YV18	633664	667809	42	42	42	43	40	37	32	22
250	E41 T186	633735	669045	36	36	36	37	35	33	26	16
251	E41 HY65	633777	669033	36	36	37	37	35	33	26	16
252	E41 H012	633804	668813	37	37	37	38	36	33	25	15
254	E41 VW11	633838	668879	37	37	37	37	35	33	26	15
259	E41 X5H2	633952	664436	37	37	37	38	37	35	28	17
261	E41 F7H6	634012	664101	37	37	37	38	37	35	27	16
262	E41 V6W9	634045	663864	37	37	37	37	36	34	26	16
264	E41 P527	634100	668899	37	37	37	37	35	33	25	14
265	E41 N924	634100	668821	37	37	37	38	35	33	25	13
266	E41 XE36	634117	663892	37	37	37	38	37	35	27	16
267	E41 H425	634130	663826	37	37	37	37	36	35	26	16
271	E41 KN36	634297	667956	44	45	45	46	45	41	38	28
273	E41 AH70	634316	663640	37	37	37	38	36	35	27	16
276	E41 TK82	634342	667852	45	47	46	47	46	42	40	30
277	E41 A3T1	634366	663784	38	37	38	38	37	35	27	16
279	E41 C1W2	634419	663611	37	37	37	38	36	35	26	15
286	E41 K316	634609	663745	39	39	39	39	38	36	28	18
287	E41 C583	634627	668021	43	46	46	46	45	41	37	27
288	E41 EW29	634643	668127	42	43	43	43	41	38	32	22
289	E41 VP94	634671	668602	36	35	36	36	34	31	23	11
291	E41 H9W6	634725	665192	41	42	41	42	41	39	34	24
292	E41 VY72	634771	663937	39	39	39	40	38	37	28	17
293	E41 D2E7	634779	664721	41	42	41	42	41	39	30	20
294	E41 H797	634780	665204	42	42	42	42	41	39	35	24
295	E41 NH97	634846	668834	37	37	37	37	35	33	25	14
296	E41 YE94	634875	668847	37	37	37	37	35	32	23	12
297	E41 A0X9	634911	664410	41	42	41	42	41	39	29	18
299	E41 CK33	635011	664586	42	43	42	43	42	40	29	19
301	E41 F6P5	635058	663093	37	36	36	37	36	34	26	15
303	E41 F1W8	635108	668151	41	44	43	44	42	38	32	22
304	E41 Y3C5	635119	663162	37	37	37	37	36	35	26	15
305	E41 NP66	635120	667785	46	53	51	51	51	43	43	32
306	E41 N9D0	635171	663453	38	38	38	39	37	36	27	16
307	E41 C670	635185	663204	37	37	37	38	36	35	26	15
308	E41 XC03	635202	668789	38	40	39	39	38	35	29	18
309	E41 PY76	635222	663329	38	38	38	38	37	36	27	16
311	E41 D596	635225	663353	38	38	38	38	37	36	27	16
313	E41 Y310	635269	663194	37	37	37	38	36	35	26	16
315	E41 WD59	635290	668830	38	40	39	39	38	35	29	19
316	E41 Y578	635316	668839	37	40	39	39	38	35	30	19
319	E41 T2N3	635345	668273	41	44	42	42	41	38	34	24
320	E41 PD71	635389	662891	36	36	36	36	35	34	26	15
321	E41 PW90	635447	668677	38	40	39	40	38	35	30	19
322	E41 VH58	635458	668194	41	45	43	44	42	39	35	24

Table A4.1

NSR	Eircode	ITM X	ITM Y	Noise Immission Level, dB LAeq(t)							
				Q1	Q2	Q3	Q4	Q5	Q6	Q7	NIGHT
324	E41 NT68	635524	668605	38	41	39	40	39	36	31	20
325	E41 RW89	635538	664086	43	43	43	44	43	41	29	18
327	E41 F248	635555	662885	36	36	36	37	35	34	26	15
328	E41 VP71	635593	663492	39	39	39	40	39	37	28	17
329	E41 TP65	635598	668093	41	47	43	44	43	39	35	24
330	E41 V020	635601	668607	38	41	40	40	39	36	31	21
331	E41 AV63	635608	668636	38	41	39	40	39	36	31	21
332	E41 H958	635610	668564	39	41	40	40	39	36	32	21
333	E41 YX38	635615	668619	38	41	39	40	39	36	31	21
334	E41 HP82	635620	668559	39	42	40	40	39	36	32	21
335	E41 Y202	635622	665496	Vacant							
336	E41 ND23	635631	668485	39	42	40	41	39	36	32	21
337	E41 W5P2	635637	663564	40	39	40	40	39	38	28	17
338	E41 A2F8	635641	662907	36	36	36	37	36	34	26	15
339	E41 V2K5	635650	663199	38	37	38	38	37	36	27	16
340	E41 XN47	635653	668575	38	41	40	40	39	36	32	21
341	E41 PR62	635672	668533	39	42	40	40	39	36	32	21
342	E41 T6Y4	635692	663580	40	40	40	40	40	38	28	17
343	E41 KF66	635701	663917	43	42	43	43	43	41	30	20
344	E41 Y680	635713	668734	38	40	39	39	38	35	31	20
345	E41 N2E9	635717	663991	43	43	43	43	43	41	29	19
346	E41 VY83	635751	663917	43	43	44	44	43	41	30	20
347	E41 P864	635757	668464	39	42	40	41	39	36	32	21
348	E41 N6C4	635758	663981	43	43	44	43	43	41	29	19
349	E41 AY03	635785	663910	43	43	44	44	43	41	30	20
350	E41 KT21	635789	663661	41	40	41	41	40	39	29	18
351	E41 XK03	635809	663952	43	43	43	43	43	41	29	19
352	E41 C1W7	635801	668018	41	48	43	44	42	39	35	24
354	E41 RF24	635831	663892	43	43	44	44	43	41	31	21
357	E41 D7P1	635922	663752	Non-Residential							
359	E41 A033	635935	668017	40	50	42	43	42	38	34	23
361	E41 A621	636000	663748	42	41	42	42	42	40	30	19
362	E41 T2D0	636054	663853	44	43	44	43	43	41	31	21
363	E41 H6V2	636054	668054	40	49	41	42	41	38	33	22
364	E41 KV62	636066	663823	43	42	43	43	43	41	30	20
365	E41 A309	636075	668002	40	52	42	43	41	38	34	22
366	E41 KR98	636093	663857	Non-Residential							
367	E41 E950	636116	664251	Non-Residential							
368	E41 HE03	636137	667972	40	53	42	43	41	38	33	22
369	E41 X094	636149	667834	40	56	42	43	41	38	33	22
370	E41 F7V0	636155	663913	Derelict							
371	E41 X3K6	636155	667802	40	53	42	43	41	39	33	22
372	E41 V8N7	636156	668365	38	42	39	40	39	36	31	20
373	E41 RR62	636166	663955	44	43	44	44	44	42	31	20
374	E41 FD45	636196	663891	44	43	44	44	44	42	32	22
375	E41 T802	636207	667934	40	52	41	42	40	38	33	22
376	E41 F5P2	636222	663606	41	40	41	41	41	39	29	19
378	E41 C827	636236	668296	38	43	39	40	39	36	31	20
379	E41 K231	636245	663634	41	40	41	41	41	39	29	19
380	E41 X925	636268	667955	39	48	40	41	40	38	32	21
381	E41 W9X4	636289	666025	46	46	45	46	44	43	40	30
382	E41 XE62	636313	667978	39	46	40	41	40	37	32	21
383	E41 A3P8	636333	664308	50	48	51	49	51	48	34	23
384	E41 EN82	636341	666085	45	45	45	46	44	42	39	28
385	E41 T665	636341	668009	39	45	40	41	39	37	32	21
386	E41 K7W8	636356	664034	46	44	46	45	46	44	33	23
387	E41 RR94	636380	664077	47	45	47	46	48	45	33	23
388	E41 K302	636442	664131	49	46	49	47	49	46	33	23
389	E41 E672	636468	664196	50	46	50	47	50	47	33	22
390	E41 YY00	636487	664228	51	47	51	48	51	48	33	22
391	E41 YP03	636540	663276	38	38	38	38	38	37	27	16
392	E41 X7D5	636546	664186	51	47	50	48	51	47	33	22
393	E41 K4W9	636587	664228	54	49	53	50	53	49	33	23
394	E41 V9W2	636644	665869	44	43	43	44	42	41	37	27
395	E41 E860	636653	667651	39	41	39	40	39	37	31	20
396	E41 HK46	636658	667635	39	41	39	41	39	37	31	20
397	E41 F8K3	636661	664391	58	53	58	54	58	54	33	22

Table A4.1

NSR	Eircode	ITM X	ITM Y	Noise Immission Level, dB LAeq(t)							
				Q1	Q2	Q3	Q4	Q5	Q6	Q7	NIGHT
398	E41 XT61	636682	667993	38	41	38	39	38	36	30	19
399	E41 D789	636704	667902	38	41	38	39	38	36	30	19
400	E41 W718	636731	668014	37	40	38	39	37	35	30	18
401	R95 AE27	636757	665590	44	43	43	44	43	41	37	26
402	E41 VW74	636767	667858	38	40	38	39	38	36	30	19
403	E41 T258	636769	667621	38	40	39	40	38	37	30	19
404	E41 K371	636777	667422	39	40	39	40	39	37	31	19
405	E41 RX81	636780	664484	50	47	51	48	51	47	33	22
406	E41 YY31	636799	667365	39	40	39	41	39	37	31	19
408	E41 N2D0	636828	667490	38	40	39	40	38	37	30	19
410	E41 H6C5	636841	664529	48	45	49	47	49	46	33	22
411	E41 A440	636844	668117	37	39	37	38	37	35	29	18
412	E41 A592	636855	664493	49	46	49	47	49	46	33	22
414	E41 EP26	636865	667255	39	40	39	41	39	37	31	20
415	E41 V577	636886	668099	37	39	37	38	37	35	29	17
416	E41 E521	636888	664516	48	45	48	46	48	45	33	22
417	E41 P208	636909	667668	38	39	38	39	38	36	29	18
420	E41 V3W8	636975	667482	38	39	38	39	38	36	30	18
423	E41 FD76	637054	667164	38	39	38	40	38	37	30	19
424	R95 TP68	637069	666098	41	40	40	41	39	38	33	22
425	R95 P970	637101	664985	43	42	43	42	42	41	33	22
426	R95 CYR8	637112	665010	43	42	43	42	42	41	33	22
427	R95 FP74	637127	665032	42	41	42	42	42	40	33	22
428	E41 PC65	637130	667394	37	38	38	39	37	36	29	18
431	R95 NY17	637155	665105	42	41	42	42	42	40	32	22
434	R95 F752	637165	666170	40	40	40	41	39	38	32	21
437	E41 Y032	637173	667618	37	38	37	38	36	35	29	17
438	R95 R156	637177	666251	40	40	39	40	39	38	32	21
440	R95 V3K1	637191	665130	42	41	42	42	41	40	32	21
444	E41 E430	637219	667405	37	38	37	38	37	35	28	17
447	R95 D7Y3	637270	665298	41	40	41	41	40	39	32	21
448	R95 NT20	637276	665757	40	40	40	40	39	38	32	21
449	E41 D516	637290	667332	37	38	37	38	37	35	29	18
450	E41 HT02	637316	667277	37	38	37	38	37	35	29	18
451	R95 YK29	637322	665324	40	40	40	41	40	38	31	21
453	E41 E9X3	637368	667351	37	37	37	38	36	35	28	17
454	R95 A362	637415	665390	40	39	40	40	39	38	31	20
456	R95 W2V6	637468	667281	36	37	36	38	36	35	28	17
457	R95 YH33	637518	667028	37	37	37	38	36	35	28	17
459	R95 XK51	637601	665563	39	38	38	39	38	37	30	19
461	R95 K280	637635	665391	39	38	38	39	38	37	29	18
462	R95 T9P7	637645	664808	39	38	39	39	38	37	29	17
465	R95 NT38	637718	665597	38	38	38	38	37	36	29	18
468	R95 NV02	637778	665661	38	37	37	38	37	36	29	18
469	R95 RC44	637800	665831	37	37	37	38	36	35	28	17
507	E41 A3E9	631852	667950	35	35	36	35	34	31	24	13
509	E41 Y4E8	633878	664412	37	37	37	37	37	35	28	17
510	E41 A4W0	634801	665213	42	42	42	43	42	40	35	24
511	E41 YX74	635101	663115	37	36	37	37	36	35	26	15
512	E41 C6Y5	635783	663047	37	37	37	37	36	35	26	16
513	E41 HK72	635787	663139	38	37	38	38	37	36	27	16
515	E41 P2P2	636654	667466	39	41	40	41	39	38	31	20
516	E41 T9W9	636814	664520	49	46	49	47	50	46	33	22
517	N/A	636106	668040	39	49	41	42	40	38	33	21
518	N/A	635819	663879	43	42	43	43	43	41	30	20