APPENDIX 12-1

CONSTRUCTION NOISE REPORT

A specialist energy consultancy

Technical Appendix 12-1

Construction Noise Report

Seskin Wind Farm, Co. Carlow

EDF Renewables Ireland

IE00102-009- R0
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COMMERCIAL IN CONFIDENCE

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Executive Summary

TNEI Services Limited (TNEI) was commissioned by MKO on behalf of EDF Renewables Ireland Ltd (the Applicant) to undertake predictions of noise levels associated with the construction of the proposed Seskin Wind Farm (hereinafter referred to as 'the Proposed Project'). 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 BS5228: Part 1 2009+A1:2014 *'Noise and vibration control on construction and open sites- Noise'* and the calculation methodology in ISO9613: 1996 *'Acoustics - Attenuation of sound during propagation outdoors' -Part 2: General Method of Calculation*', together with noise data for appropriate construction plant.

Eighteen residential receptors neighbouring the Proposed Project were identified as the nearest properties located to the proposed construction activities on the site. Predictions have been made assuming that all items of plant are operating continually throughout the assessment period to provide a precautionary scenario. In addition, the noise predictions assumes that noise sources would be located within the most likely activity areas closest to the receptors, whereas 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 inherently likely to over-predict the actual sound levels that are likely to be experienced.

The results show that the predicted noise levels from construction activities would be below the most stringent of the noise threshold levels detailed in BS5228. Accordingly, the assessment concludes that there would be no significant construction noise impacts.

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ANNEXES

1 Introduction

1.1 Brief

1.1.1 TNEI was commissioned by MKO to undertake a construction noise assessment for the proposed Seskin Wind Farm (hereinafter referred to as 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 in accordance with BS5228-1:2009 +A1:2014 [(1)];
- Undertake predictions of activity noise from different construction phases that would be incident at the nearest sensitive receptors;
- Compare the predicted noise levels with the derived threshold values; and,
- Identify any requirements for mitigation measures, if needed.

1.2 Nomenclature

1.2.1 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; and
- **CNAL** (Construction Noise Assessment Location) refers to any location where the noise immission levels are calculated and assessed.

1.2.2 Unless otherwise stated, all noise levels refer to free field levels i.e. noise levels without influence from any nearby reflective surfaces.

1.3 Site Description

1.3.1 The Proposed Project is located in County Carlow approximately 3.1km northwest of the village of Oldleighlin. The approximate grid coordinates (ITM) for the centre of the Proposed Wind Farm are 663697, 668840 and the Proposed Wind Farm layout is shown on Figure A1.1 in Annex 1.

1.3.2 It is proposed to access the Proposed Wind Farm site during both the construction and operational phase via an existing agricultural site entrance off the L3037 local road along the western boundary of the Proposed Project site in the townland of Ridge. It is proposed to provide a crossroads type junction on the L-30372 to serve as a crossing point for all construction traffic crossing from the southern part of the Proposed Wind Farm site

(Turbines 3 to 7) to the northern section (to Turbines 1 and 2). There will be no construction traffic permitted to access the site via the L-30372 at the proposed junction.

1.3.3 Construction of the Proposed Project would require felling, the laying of tracks across the site/upgrading tracks to roads, establishing a construction compounds, establishing hardstanding for a BESS compound, excavation of turbine foundations, construction of turbine bases, installation of turbines, and the installation of a substation and other infrastructure such as trenching for electrical cables.

1.3.4 Construction is anticipated to last 18-24 months. An indicative construction timetable is shown as Table 1.1 based on a 24-month construction schedule. Activities denoted with blue cells have been included in the noise assessment. Periods denoted with grey cells have not been considered within the assessment as they are not expected to generate high levels of noise.

Table 1.1: Indicative Construction Timetable

Task	Quarter							
	1	2	3	4	5	6	7	8
Site Health & Safety								
Proposed Grid Connection Route								
Site Compounds								
Site Roads								
Substation, BESS and Electrical works								
Turbine hardstands								
Turbine Foundations								
Backfilling and Landscaping								
Turbine Delivery and erection								
Substation and BESS commissioning								
Turbine Commissioning								

1.3.5 TNEI has undertaken noise propagation modelling for quarters 2, 4, 5 and 6 on the assumption that activities undertaken during these periods would generate the highest noise levels. In addition to the above construction activities for the Proposed Wind Farm, underground electrical cabling will be laid to connect the Proposed Wind Farm to the existing Kilkenny 110kV substation. The temporary noise effects that are likely to occur along the length of the Proposed Grid Connection Route are also considered within this assessment.

2 Noise Planning Policy and Guidance

2.1 Overview of Noise Planning Policy and Guidance

2.1.1 There is no published statutory Irish guidance which 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, 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 British Standard BS5228:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites'.

2.2 Relevant Guidance

2.2.1 The BS5228:2009 standard provides useful guidance on practical noise control. Part 1, provides 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 noise sources, noise calculation procedures, mitigation measures and their effectiveness.

2.2.2 Part 1 also contains sound power level data for a variety of construction plant. This data was obtained from field measurements of actual plant operating on construction and open sites in the United Kingdom and is therefore appropriate to use as source level data for construction noise predictions.

2.2.3 The 2009 version of BS5228 was subject to an additional update in 2014. Accordingly, the construction noise assessment in this chapter has been undertaken in accordance with BS5228 1:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites. Noise'*, (BSI, 2009), hereinafter referred to as BS5228.

3 Potential Impacts

3.1 Construction Noise Sources

3.1.1 Noise levels from construction activities would vary continually over time as activities and plant start and stop and move around the Proposed Project. In order to assess the potential impacts of construction noise a scenario, utilising precautionary conditions, is considered where all construction plant and activities are assumed to be working continually and in locations closest to the nearest NSRs.

3.2 Construction Phases

3.2.1 Although an indicative timetable has been provided, a specific construction schedule has not been determined at this stage. Chapter 4: Description of the of the EIAR does, however, provide descriptions of some of the likely construction activities that would be undertaken and the type of plant that would be used.

3.2.2 It is also noted that construction activities are likely to 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, from delivery and unloading of abnormal loads or health and safety requirements, or to ensure optimal use is made of fair weather windows for concrete deliveries, the erection of turbine blades and the erection and dismantling of cranes. No working would usually be undertaken outside core hours without prior agreement with the relevant Local Authority (LA).

3.2.3 To consider the variation in noise levels that would occur throughout the construction period, a series of construction scenarios have been modelled. The scenarios are based on the combination of construction tasks detailed in the indicative timetable (see Table 1.1), Chapter 4: Description and TNEI's knowledge and experience of other similar sites and construction schedules.

3.2.4 Each scenario has been assessed against a set of threshold levels in order to determine the likely temporary noise impacts.

3.2.5 The assessment does not consider the noise impacts associated with decommissioning, as the plant and activities used for that phase are assumed to be similar in nature (and noise output) to those already considered in the modelled construction scenarios. Accordingly, if noise levels during the construction phases are acceptable, they will also be acceptable during decommissioning.

4 Methodology

4.1 Methodology for the Prediction of Noise

4.1.1 In order to predict the noise immission levels attributable to the construction of the Proposed Project, noise propagation models are 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.

4.1.2 For each CNAL, the $L_{Aeq(t)}$ levels have been predicted in accordance with ISO9613-2:1996 *'Acoustics - Attenuation of sound during propagation outdoors: General method of calculation'*. (2)

4.1.3 The ISO 9613 propagation model was chosen in preference to the calculation method presented in BS5228, primarily because of some of the significant distances from source to receptor evident on the Proposed Project site. Specifically, BS5228 notes that at distances over 300m noise predictions using the BS5228 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 1,000m.

4.1.4 The ISO 9613 model can take account of the following factors that influence sound propagation outdoors:

- geometric divergence;
- air absorption;
- reflecting obstacles;
- screening;
- vegetation; and
- ground reflections.

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

4.1.6 For the purposes of this assessment, all noise level predictions have been undertaken using a receiver height of 1.5m above local ground level. Soft ground (G=1) attenuation has been assumed at all locations except for water bodies, construction compounds, 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.

4.2 Limitations of the Noise Model

The noise propagation models are intended to give a good approximation of the specific noise level and the contribution of each individual 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 can only be approximated and not all barrier attenuation will have been accounted for;
- Unless specifically stated, the models assume all noise sources are operating continuously and simultaneously, estimating a noise level under theoretical precautionary conditions; and
- All mobile plant assumed to be working on tracks (excavators, dozers, rollers etc) have been modelled as moving point sources along their anticipated movement paths and the sound power level of the source is effectively averaged out across the length of the entire line. This will give an approximation of the overall noise levels from mobile plant at receptor locations; however, in reality noise levels would fluctuate as construction plant and activities move around in their activity areas.

4.3 Assessing Construction Noise Effects

4.3.1 Annex E, part E.3.2 of BS5228 provides example criteria for assessing the significance of construction noise effects and acceptable limits for construction noise.

4.3.2 Table E.1 of BS5228 is reproduced below in Table 4.1 and contains an example of the significance criteria that can be used to assess construction activities.

Table 4.1: Example of Threshold of Potential Significant Effect at Dwellings ($dB_{(A)}$)

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	55	60	65
Daytime (07:00 – 19:00) and 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;

4.3.3 The values can be considered thresholds for the construction noise levels (quantified using the L_{Aeq} noise metric). The values in each category are to be used where the existing noise level at each location, rounded to the nearest 5 dB, is below the level given for a particular time of day. BS5228 provides the following advice regarding the threshold levels:

"Note: 1 A potential significant effect is indicated if the $L_{Aeq,T}$ 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 $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise.

Note 3: Applied to residential receptors only."

4.3.4 Therefore, the assessment of construction noise reflects a specific noise threshold for the locality (set relative to the existing ambient noise levels) for a particular period of the day, rather than an absolute noise level.

4.3.5 It should be noted that exceedance of the limit 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".*

4.4 Study Area

4.4.1 Noise Sensitive Receptors (NSRs) in this assessment are considered as nearby residential properties which could be affected by construction noise and, therefore, may require protection from Proposed Project activities. The Study Area for this noise assessment has been defined through the identification of the closest NSRs to the Proposed Project. Of all the NSRs identified (shown in Figure A1.1), a representative sample of CNALs have been chosen to assess in detail the closest receptor or group of receptors.

4.4.2 The CNALs were chosen on the assumption that if noise levels are within acceptable levels at the closest receptors, then it is reasonable to assume they would also be acceptable at more distant locations.

4.4.3 Table 4.2 details the CNALs considered within the assessment, and they are also shown on Figure A1.1 included in Annex 1.

Table 4.2: Construction Noise Assessment Locations

CNAL Name	Coordinates (ITM)	
	Eastings	Northings
CNAL01	662730	670033
CNAL02	662614	670155
CNAL03	663257	670292

CNAL Name	Coordinates (ITM)	
	Eastings	Northings
CNAL04	663822	670342
CNAL05	664332	670302
CNAL06	664468	670252
CNAL07	664688	669900
CNAL08	664705	669725
CNAL09	664757	669384
CNAL10	664824	668894
CNAL11	664698	668149
CNAL12	664248	667759
CNAL13	663159	667611
CNAL14	662682	668090
CNAL15	662840	669042
CNAL16	662557	669150
CNAL17	661841	668376
CNAL18	662627	667433

4.5 Baseline Noise Levels

4.5.1 Baseline noise level monitoring was undertaken as part of the operational noise assessment undertaken for the Proposed Project. (See Appendix 12-2 for more information).

4.5.2 At all locations the ambient sound levels were below the Category A Threshold Values, as detailed in Table 4.1: Example of Threshold of Potential Significant Effect at Dwellings (dB(A)).

4.6 Construction Noise Level Thresholds

4.6.1 Having due regard to the existing ambient noise levels around the Proposed Project, the BS5228 Category A Threshold Values defined in Table 4.1 above have been considered at all CNALs for the construction noise assessment.

5 Noise Impact Assessment

5.1 Modelling of Individual Sound Sources

5.1.1 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 continually operating 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 an assessment under a precautionary scenario.

5.1.2 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 2: Noise Model Data.

5.1.3 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* (3) (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 actually given at the operator position inside a Q Cab. In order 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 within CadnaA assuming the quoted sound pressure levels (SPLs) have been measured at a distance of 1m.

5.1.4 For all other construction activities source noise level data is taken from Annex C of BS5228, which provides octave band SPL levels for a wide variety of construction plant and activities suitable for the estimation of noise immission levels.

5.1.5 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 generators, lighting rigs and pumps. Static equipment is usually located at a fixed location for an extended period of time.

5.1.6 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.

5.1.7 All static items of plant and activities have been modelled as single point sources. All mobile plant (excavators, dozers, dumpers etc.) have been modelled as either a line 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.

5.2 Modelling of Construction Activities.

5.2.1 Noise propagation modelling has been undertaken considering the key activities that are likely to occur throughout the construction period based on the indicative information found Chapter 4: Description and the indicative timetable in Table 1.1 above. Details of the items of plant assumed to be operating in each modelled scenario, as well as noise data for each modelled noise source, are included in Annex 2: Noise Model Data.

5.2.2 The modelled scenarios represent the following construction activities:

- Scenario 01:
  - The tracks are built from the site entrance towards the construction compound and extending to turbines 5, 6 & 7.
  - Tree felling around the location of the construction compound and turbines 5, 6 & 7 is taking place .
- Scenario 02:
  - The remaining tracks are built from turbine 5 towards turbines 1,2,3 & 4.
  - Tree felling around turbines 1, 2, 3 & 4 and around the BESS compound is taking place.
  - The foundations and hardstanding for turbines 5, 6 & 7 are prepared, including excavation.
  - Foundations are anchored and poured at Turbines 5, 6 & 7
- Scenario 03:
  - The foundations and hardstanding for turbines 1, 2, 3 & 4 are prepared, including excavation.
  - Foundations are anchored and poured for turbines 1,2, 3 & 4
  - Backfilling and landscaping along tracks from site entrance to Turbines 5, 6 & 7
  - Erection of Turbines 5, 6 & 7
- Scenario 04:
  - Backfilling and landscaping along tracks from turbine 5 to turbines 1,2,3 & 4.
  - Erection of Turbines 1, 2, 3 & 4 .
- Night Scenario : Night-time diesel generators for the cabin and lighting at both construction compounds are operational, just in case this is required on rare occasions.

5.3 Calculated Noise Immission Levels

Table 5.1 presents the calculated noise immission levels at each CNAL for all modelled scenarios.

Table 5.1: Predicted Construction Noise Immission Levels, dB $L_{Aeq(t)}$

CNAL	Scenarios Modelled				
	01	**02**	**03**	**04**	Night
CNAL01	39	44	43	42	16
CNAL02	37	42	40	40	17
CNAL03	36	46	44	44	16
CNAL04	35	47	44	45	16
CNAL05	35	44	45	44	15
CNAL06	33	40	40	39	15
CNAL07	34	43	42	42	16
CNAL08	35	43	43	42	16
CNAL09	36	43	43	41	16
CNAL10	38	46	44	42	16

CNAL	Scenarios Modelled				
	01	02	03	04	Night
CNAL11	39	43	42	37	15
CNAL12	41	42	42	36	16
CNAL13	48	44	45	40	20
CNAL14	63	46	54	40	24
CNAL15	49	46	47	44	25
CNAL16	44	41	43	40	18
CNAL17	35	35	35	32	12
CNAL18	39	38	38	35	16

5.3.1 The wind turbines construction noise assessment results show that the theoretical precautionary scenario predicted construction noise levels in core hours for Scenarios 1-4 are below the 65 dB(A) threshold Levels at all CNALs. The night-time scenario included in the assessment to appraise an unlikely occurrence of work occurring outside of core hours also shows that predictions are below the night-time 45 dB(A) criteria at all CNALs. If considering potential evening and week-end work (outside of core hours), the predictions shows that the Evenings and Weekends 55 dB(A) criteria could be exceeded at CNAL14 located immediately adjacent to the site entrance tracks, however this would be assuming construction of tracks right next to the property in an evening which is outside the proposed core hours and is therefore not anticipated to occur. Therefore, there would be no significant construction noise effects.

5.3.2 Results for all NSRs are also shown in Annex 3 for completeness.

5.4 Proposed Grid Connection Route

5.4.1 For the Proposed Grid Connection Route, 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 4.7.8.4 in Chapter 4 of the EIAR, along with Appendix 4-6 of the EIAR describes the construction of the Proposed Grid Connection Route underground electrical cable trench in more detail.

5.4.2 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. It should be noted, however, that this would only occur where construction activities are directly opposite a dwelling within approximately 20m and this would result in an instant noise levels increase (i.e. not considering a full construction day). To put this into context, trenching and backfill activities are anticipated to move along the Proposed Grid Connection Route at approximately 150m to 300m a day, therefore, the length of time when construction activities will be occurring adjacent to any given receptor is only 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.

5.4.3 It is possible that noise levels from trenching and backfill operations may occasionally exceed the BS5228 threshold if within 20m of a dwelling, however this would only occur for a short period of time at any one location. Accordingly, the impact is not deemed significant.

5.4.4 At some watercourse, culvert and drain crossings there may be a requirement for Horizontal Directional Drilling (HDD). Specifically, this is required for all 7 no. bridge crossings and could be required for some smaller water/culvert crossings. HDD for large crossing would require the use of multiple items of plant including pumps, mud recyclers, drilling rigs and generators, however, the proposed plant for these small crossings is a small Vermeer D36 x 50 Directional Drill. Calculations of the Vermeer DD rig, assuming a source noise level of 94 dBA at 1m, indicates that noise levels would be below the 65dBA threshold from a distance of approximately 30m. For small crossings, the work would likely be completed within 1 and 2 weeks so it will be temporary only.

5.4.5 Where activities involving the small HDD drilling rig are within 30m of a dwelling then noise mitigation measures should be considered. This includes the erection of temporary boarding alongside the drilling rig or use of 'acoustic blanket panels' to hang from heras fencing or similar. This should be installed as close to the drilling rig as is practicable and fitted so as to interrupt any direct line of site between the drilling rig and the closest residential receptors. Examples of appropriate products include Echo Noise Defender and Soundex DeciBloc.

5.5 Road junctions that may need widening or improvements

5.5.1 Construction works related to road junction improvements may occur outwith the CNALs considered above, in close proximity to residential receptors. It is therefore possible that noise from these activities may at times exceed the guideline levels, however it should be noted that this will be a short-term, temporary impact. Good practice during construction is recommended and will reduce noise levels from these short-term works to minimum levels.

6 Mitigation Measures

6.1.1 No significant effects resulting from construction noise are predicted. Nevertheless, good practice during construction is recommended and will be presented in a Construction Environmental Management Plan (CEMP) (Appendix 4-4) to minimise any potential noise impacts.

6.1.2 The core hours for the proposed works will be normal construction hours 07:00 to 19:00 Monday to Friday and 07:00 to 13:00 Saturday. There will 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 or health and safety requirements, or to ensure optimal use is made of fair weather windows for concrete deliveries, the 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 should be agreed in advance.

6.1.3 Good site practices for construction of the Proposed Wind Farm, along the Proposed Grid Connection Route and road junctions will be implemented to minimise the likely effects. Particular care will be taken at watercourse, culvert and drain crossings along the underground electrical cabling route. Section 8 of BS5228-1:2009+A1:2014 recommends a number of simple control measures as summarised below that can be employed onsite:

- 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;
- All vehicles and mechanical plant will be fitted with effective exhaust silencers and be subject to programmed maintenance;
- Select inherently quiet plant where appropriate - all major compressors will be 'sound reduced' models fitted with properly lined and sealed acoustic covers, which will be kept closed whenever the machines are in use;
- All ancillary pneumatic percussive tools will be fitted with mufflers or silencers of the type recommended by the manufacturers;
- Machines will be shut down between work periods (or when not in use) or throttled down to a minimum;
- Regularly maintain all equipment used on site, including maintenance related to noise emissions;
- Vehicles will be loaded carefully to ensure minimal drop heights so as to minimise noise during this operation; and
- All ancillary plant such as generators and pumps will be positioned so as to cause minimum noise disturbance and if necessary, temporary acoustic screens or enclosures will be provided.
- At any location within 30m of a residential receptor, where trenching work or directional drilling activities are required for the Proposed Grid Connection Route, the installation of temporary boarding alongside the drilling rig or 'acoustic blanket panels' hanging from heras fencing (or similar) may be used to mitigate noise emissions.

7 Summary

7.1.1 The noise impact assessment has considered the existing noise environment at local residential receptors to determine appropriate noise threshold levels for construction activities.

7.1.2 Noise propagation modelling has been undertaken and the anticipated noise immission levels presented for scenarios likely to occur throughout the construction period of the Proposed Project. The modelled scenarios consider the 'noisiest' activities that are likely to occur during the construction period and the modelling assumes that the construction activities are occurring at locations within the Proposed Project site that are closest to the NSRs.

7.1.3 The predicted levels are below the Category A Threshold Levels as detailed within BS5228 during the proposed core hours of work. Accordingly, construction noise impacts are below the indicator for a potential significant effect. No significant effects resulting from construction noise are predicted, nevertheless, good practice during construction is recommended following guidance from BS5228. If occasional work is undertaken outside of core hours, especially during construction of access tracks at the site entrance, this should be agreed in advance.

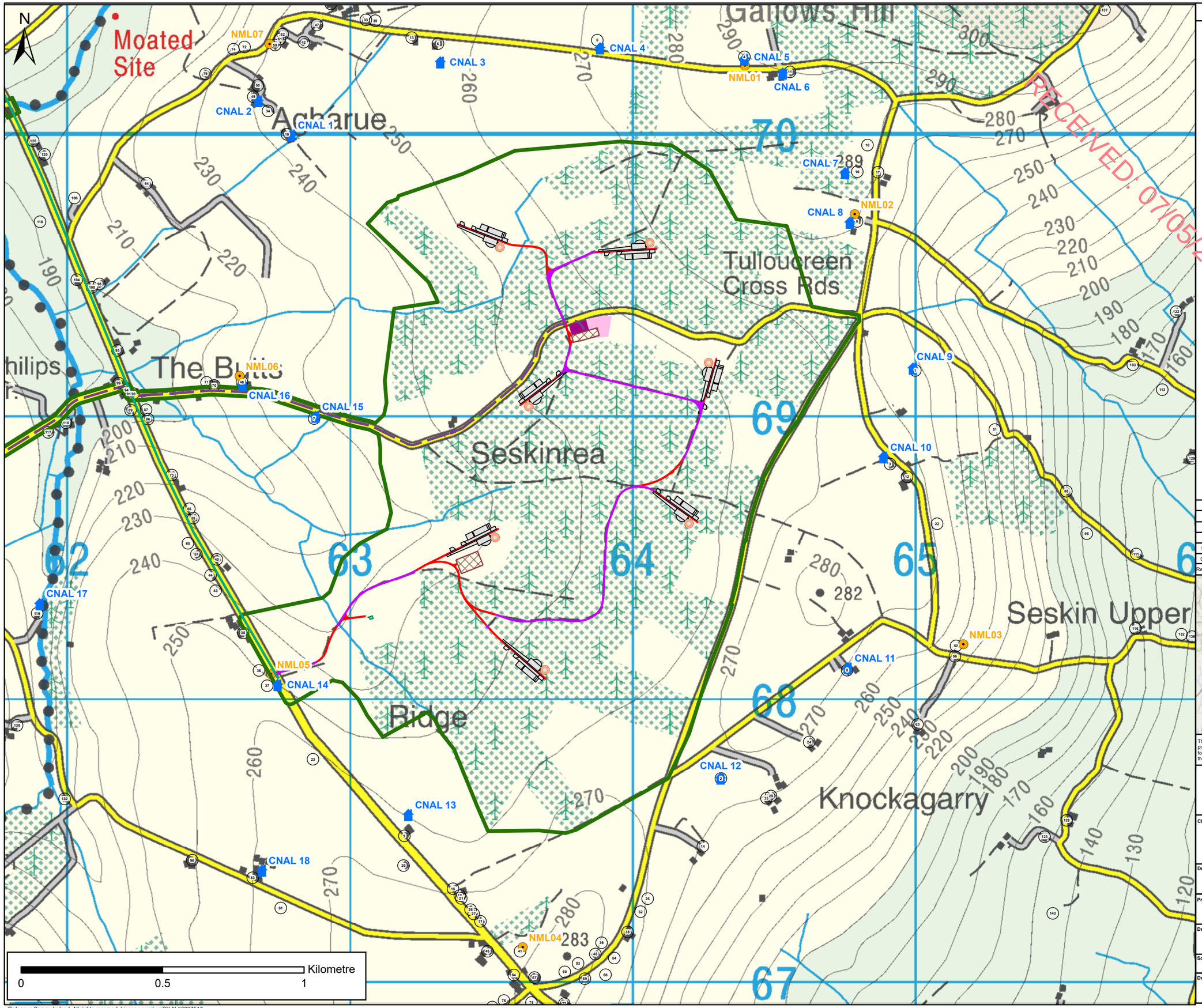
8 References

1. **British Standards Institute.** *Code of practice for noise and vibration control on construction and open sites. Noise.* UK : BSI, 2014. BS 5228-1:2009+A1:2014 .

2. **(ISO), International Organisation for Standardisation.** *Acoustics – Attenuation of Sound During Propagation Outdoors: Part 2 – General Method of Calculation.* Geneva : ISO, 1996. ISO 9613-2:1996.

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

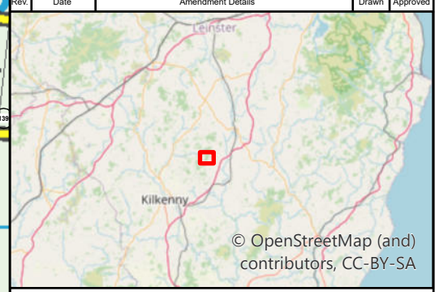
Annex 1 – Figure



LEGEND

- Proposed EIAR Site Boundary
- Construction Noise Assessment Locations (CNALs)
- Noise Monitoring Locations (NMLs)
- Proposed Turbine Delivery Route
- Proposed Grid Connection Route
- Proposed Turbine Foundation
- Proposed Turbine Hardstanding area
- Proposed New Roads
- Proposed Upgrades to Existing Roads
- Proposed Temporary Construction Compounds
- Proposed Met Mast
- Proposed Battery Energy Compound
- Proposed Onsite 38 kV Substation

Rev.	Date	Amendment Details	Drawn	Approved
1	30/04/2024	CLIENT COMMENTS	JCM	MC
0	11/03/2024	FIRST ISSUE	ST	MC



Client: EDF renewables

Drawing Status: FOR PLANNING

Project Title: SESKIN WIND FARM, CO. CARLOW

Drawing Title: FIGURE A1.1 -CONSTRUCTION NOISE ASSESSMENT LOCATIONS

Scale:	Original Size:	Spatial Reference:
1:12,500	A3	IRENET95 Irish Transverse Mercator

Drawing Number: IE00102-013

Annex 2 – Noise Model Data

Modelled Scenario	Construction Activity	Specific Machinery/Activity
Scenario 1 (Q2)	Tree Felling using a Harvester, Forwarder & Skidder near first temporary construction compound and T5, T6 & T7	Tracked excavator Dozer Dump Truck (empty)
Scenario 1 (Q2)	Construction of Road from entrance to first compound and T5,T6&T7 and cable trenching. Using Excavator, Dozer & Dumper	Forwarder Harvester Skidder
Scenario 2 (Q4)	Tree Felling using a Harvester, Forwarder & Skidder near T1, T2,T3 & T4 and second temporary construction compound near substation.	Tracked excavator Dozer Dump Truck (empty)
Scenario 2 (Q4)	Construction of Road from T5 to T1, T2,T3 & T4 and cable trenching. Using Excavator, Dozer & Dumper	Forwarder Harvester Skidder
Scenario 2 (Q4)	Foundation prep & Hardstanding's for T5, T6 & T7	Tracked excavator Dump Truck (tipping fill)
Scenario 2 (Q4)	Foundation Pour, Anchorage & Shuttering using Concrete Mixer & Pump, Excavator for T5, T6 & T7	Concrete mixer truck (discharging) & concrete pump (pumping) Tracked excavator
Scenario 3 (Q5)	Foundation prep & Hardstanding's for T1, T2,T3 & T4	Tracked excavator Dump Truck (tipping fill)
Scenario 3 (Q5)	Foundation Pour, Anchorage & Shuttering using Concrete Mixer & Pump, Excavator for T1, T2,T3 & T4	Concrete mixer truck (discharging) & concrete pump (pumping) Tracked excavator
Scenario 3 (Q5)	Backfilling from site entrance to T5,T6 &T7 using dozer & vibratory roller	Dozer Vibratory roller
Scenario 3 (Q5)	Erection of T5,T6 &T7 using wheeled crane, tracked crane & tracked excavator	Tracked mobile crane Mobile telescopic crane Tracked excavator
Scenario 4 (Q6)	Backfilling from T5 to T1,T2,T3 &T4 using dozer & vibratory roller	Dozer Vibratory roller
Scenario 4 (Q6)	Erection of T1,T2,T3 &T4 using wheeled crane, tracked crane & tracked excavator	Tracked mobile crane Mobile telescopic crane Tracked excavator
Scenario 4 (Q6)	Backfilling to Turbine 7 using dozer & vibratory roller	Dozer Vibratory roller

Annex 3 – Noise Predictions at NSRs

Predicted Construction Noise Immission Levels, dB $L_{Aeq(t)}$ at all NSRs

H / CNAL	Scenarios Modelled				
	1	2	3	4	Night
H6(CNAL08)	35	43	43	42	16
H7(CNAL09)	36	43	42	41	16
H8(CNAL12)	41	42	42	36	16
H9(CNAL10)	38	45	43	42	16
H10(CNAL05)	35	44	45	44	15
H11(CNAL04)	35	46	44	44	16
H12(CNAL03)	35	43	42	42	15
H13(CNAL15)	49	46	47	44	25
H14(CNAL11)	39	43	42	37	15
H15(CNAL13)	47	44	45	40	20
H16(CNAL07)	34	42	42	41	15
H17(CNAL06)	35	43	44	44	15
H18	38	44	43	41	16
H19	35	43	41	41	15
H20	39	40	40	34	14
H21	42	43	44	37	17
H22	33	40	41	40	15
H23	33	39	39	38	14
H24	42	43	44	39	17
H25(CNAL01)	39	44	43	42	16
H26	46	43	44	38	18
H27	41	44	45	39	17
H29	37	42	41	38	14
H30	50	44	46	40	23
H31	40	41	41	36	15
H32	39	40	40	35	14
H33	41	44	45	38	17
H34	41	43	45	38	17
H35	39	41	40	35	14
H36	39	41	40	35	14
H37	34	41	40	39	14
H38	41	43	44	38	17
H39	39	40	39	35	14
H40	34	41	40	39	14
H41(CNAL02)	38	42	42	41	17
H42	53	45	48	41	24
H43	57	45	50	40	23
H44(CNAL14)	57	44	49	40	23
H45	39	40	39	35	13
H46	39	40	40	35	15
H47	50	45	46	40	23
H48	41	41	42	36	16
H49	35	41	39	39	13
H50	50	45	47	40	23
H51	49	45	46	40	23
H52	41	42	44	38	16
H53(CNAL16)	45	42	43	40	22
H54	34	40	39	38	13
H55	39	40	39	34	15
H56	37	42	41	40	17
H57	37	41	41	40	14
H58	29	36	36	35	11
H59	31	36	36	34	10
H60	38	39	38	34	13
H61	38	38	38	33	13
H62	33	39	38	38	13
H63	32	36	37	34	10
H64	48	44	46	39	23
H65	47	43	45	39	22
H66	35	41	39	38	13
H67	40	39	38	34	15
H68	35	40	39	38	13
H69	35	39	39	38	13
H70	32	37	37	33	10
H71	40	40	40	35	15
H72	48	44	45	39	22
H73	47	43	45	39	22
H74	40	39	39	34	15
H75	37	37	37	32	12
H76	38	39	38	34	12
H77	45	41	42	39	17
H78	44	41	42	38	17
H79	33	38	38	37	12
H80	45	42	43	38	21
H81	33	38	38	37	12
H82	38	38	37	33	12

H83	38	38	37	33	12
H84	37	37	37	33	12
H85	37	37	37	33	12
H86	33	38	37	36	12
H87	37	36	37	31	12
H88	39	38	37	34	13
H89	36	36	36	31	11
H90(CNAL18)	39	38	38	35	15
H91	38	39	39	37	17
H92	35	36	36	31	11
H93	41	39	40	38	15
H94	39	39	39	36	15
H95	20	27	27	27	3
H96	39	38	39	37	15
H97	39	38	38	36	15
H98	38	38	38	36	14
H99	32	35	35	30	8
H100	38	38	38	36	14
H101	38	38	38	36	14
H102	19	26	26	25	2
H103	38	36	37	31	13
H104	31	35	36	35	11
H105	38	38	39	37	13
H106	38	38	38	36	14
H107	39	38	39	36	13
H108	31	34	34	30	8
H109	36	36	35	32	11
H110	27	34	34	32	9
H111	37	37	37	35	12
H112	30	35	35	34	10
H113	36	36	36	34	12
H114	30	35	35	34	10
H115	30	35	35	34	10
H116	30	35	35	34	10
H117	37	37	38	36	13
H118	21	29	29	28	5
H119	30	33	33	29	7
H120	26	34	33	32	8
H121	30	34	33	29	7
H122	30	35	34	33	10
H123	21	29	29	28	5
H124	36	36	37	35	13
H125	34	36	35	34	11
H126(CNAL17)	35	35	35	32	12
H127	33	35	35	34	11
H128	30	34	34	33	10
H129	28	35	34	33	9
H130	26	32	32	30	6
H131	30	33	33	29	7
H132	32	35	35	33	10
H133	26	32	32	30	6
H134	31	34	34	33	10
H135	29	33	32	29	6
H136	25	32	32	31	7
H137	36	34	35	31	11
H138	29	33	32	28	6
H139	22	30	30	29	6
H140	29	32	32	28	6
H141	31	34	34	33	9
H142	29	33	33	29	7
H143	29	33	32	28	6
H144	29	34	34	33	9
H145	36	34	35	31	11
H146	22	30	30	29	6
H147	38	38	39	35	16
H148	23	31	31	29	6
H149	29	32	32	28	6
H150	28	33	32	30	6
H151	29	32	32	28	6
H152	32	34	33	32	9
H153	31	34	33	32	9
H154	28	33	33	32	8
H156	24	31	31	29	6
H157	28	33	33	32	8
H158	28	33	32	32	8