

Rampion 2 Wind Farm Category 6: Environmental Statement Volume 4, Appendix 21.2: Construction plant list (clean)

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1. Introduction

- 1.1.1 This Appendix supports **Chapter 21: Noise and vibration, Volume 2** (Document Reference: 6.2.21) of the ES and relates to the onshore elements of the Proposed Development. This Appendix presents detailed modelling methodologies and results.
- 1.1.2 The full assessment of potential effects has been detailed in **Chapter 21: Noise and vibration, Volume 2** (Document Reference: 6.2.21) of the ES which includes relevant policy and legislation, baseline conditions, the Maximum Design Scenario (MDS), the noise assessment and cumulative effects.
- 1.1.3 This Appendix should also be read in conjunction with:
- **Chapter 4: The Proposed Development, Volume 2** (Document Reference: 6.2.4) of the ES which provides information relating to the Proposed Development upon which the noise modelling assumptions have been based; and
 - **Chapter 5: Approach to the EIA, Volume 2** (Document Reference: 6.2.5) of the ES which sets out the overall environmental impact assessment (EIA) approach which has been used to determine potential significant effects for noise and vibration.
- 1.1.4 This Appendix provides the assumptions and data used within the noise predictions and a fuller set of results which have been summarised in **Chapter 21: Noise and vibration, Volume 2** (Document Reference: 6.2.21) of the ES. The Appendix is set out as follows:
- **Section 2: Scope;**
 - **Section 3: Noise predictions methodology;**
 - **Section 4: Assumptions and limitations;**
 - **Section 5: Glossary and abbreviations;** and
 - **Section 6: References list.**



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2. Scope

2.1.1 The following noise and vibration sources as part of the onshore elements of the Proposed Development have been assessed in the Environmental Statement (ES):

- temporary effects from the construction and operation of the temporary construction compounds;
- temporary effects from the trenchless crossing works;
- temporary effects from onshore substation construction;
- temporary effects from onshore cable installation (trenched);
- temporary effects from construction and use of temporary and permanent accesses;
- temporary effects from construction road traffic (no additional information is within this Appendix); and
- decommissioning.



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3. Noise predictions methodology

3.1 Sound propagation model

- 3.1.1 To predict specific sound levels at the nearest noise sensitive receptors (NSRs) a noise model has been produced using SoundPLAN 8.2, a software package which implements the prediction methodology contained within ISO 9613-2:1996 (ISO, 1996).
- 3.1.2 SoundPlan modelling software utilises publicly available topography data and digital terrain mapping to generate a 3D environmental model. The model implements the following elements to predict noise propagation:
- sound source location;
 - relative distances between sound sources / receivers;
 - location and dimensions of object barriers including man-made or natural;
 - ground contours, determining the relative ground heights; and
 - ground absorption effects due to soft / hard ground.

3.2 Modelling assumptions

- 3.2.1 Average and maximum worst-case scenarios have been assessed:
- Average worst-case scenario is representative of all proposed noise emitting activity simultaneously taking place spatially averaged across the corresponding activity location; and
 - Maximum worst case scenario is representative of all proposed noise emitting activity simultaneously taking place in a location within the Site that is closest to the NSR being assessed.
- 3.2.2 All plant has been modelled as area sources.
- 3.2.3 All sources have been modelled at 1.5 m above ground level.

3.3 Construction noise assessment methodology

- 3.3.1 BS 5228-1:2009 + A1:2014 (BSI, 2014a and 2014b) provides guidance on the methodology and criteria for assessing and identifying potential significant effects at NSRs.
- 3.3.2 The assessment methodology that has been deemed appropriate for this assessment is the 'ABC Method' and is provided in Table E.1 of Annex E of BS 5228-1:2009 +A1:2014.
- 3.3.3 The ABC method considers the appropriate period (night, evenings / weekends or daytime). The existing ambient noise level, at the assessed NSR, is determined and rounded to the nearest 5 dB. This is then compared with the values in Table

E.1. to derive the noise category. Table E.1 provides thresholds of significance for each category over each time period. If the noise level from site activity exceeds the appropriate category value at the NSR, then a potential significant effect is indicated.

- 3.3.4 The existing baseline monitoring measurements indicated that environmental sound levels across the project area are generally reflective of the "Category A" threshold values. However, there are some locations at which Category B and C thresholds have been established.

4. Assumptions and limitations

4.1 Overview

- 4.1.1 This section sets out the detailed noise assumptions used within the predictions.
- 4.1.2 The sound power levels for each construction area and type of construction plant have been based on the data available in the BS 5228-1:2009+A1:2014 (British Standards Institution, 2014a).

4.2 Temporary construction compounds for noise assessment

Table 4-1 Plant list for temporary construction compound calculations (construction)

Source	Number of sources	Sound Power Level dB(A) (including corrections)	Percentage time in use (hourly)
Construction of the temporary construction compound (site clearance)			
Excavator	2	105	80.00%
Dozer	1	108	80.00%
Wheeled Loader	1	96	80.00%
40t Articulated Dump Truck (ADT)	1	107	80.00%
Water Pump	1	93	100.00%
Construction of the temporary construction compound (internal haul roads)			
Excavator	2	108	80.00%
Dozer	1	106	80.00%
40t ADT	2	107	80.00%
Road Planer	1	110	50.00%

Table 4-2 Plant list for temporary construction compound calculations (operational)

Source	Number of sources	Sound Power Level dB(A) (including corrections)	Percentage time in use (hourly)
Construction of the temporary construction compound (operational)			
Generator	2	93	50.00%
Construction of the temporary construction compound (operational fabrication areas)			
Forklift	1	107	80.00%
Mobile crane	2	99	50.00%
Handheld saw	1	113	50.00%
Generator	2	103	50.00%
Handheld drill	1	106	50.00%
Concrete batching (mixer)	1	110	20.00%
Construction of the temporary construction compound (operational haul roads)			
40t ADT	2	107	80.00%

4.3 Trenchless crossings for noise and vibration assessment

Table 4-3 Plant list for trenchless crossing noise calculations

Source	Number of sources	Sound Power Level dB(A) (including corrections)	Percentage time in use (hourly)
Daytime			
Excavator	2	99	100.00%
Dumper	1	104	100.00%
Mobile crane	1	95	100.00%
Drilling rig	2	106	100.00%
Water pump	3	93	100.00%

Source	Number of sources	Sound Power Level dB(A) (including corrections)	Percentage time in use (hourly)
Excavator	2	99	100.00%

4.4 Onshore substation construction for noise assessment

Table 4-4 Plant list for all plant and equipment associated with the onshore substation construction calculations

Source	Number of sources	Sound Power Level dB(A) (including corrections)	Percentage time in use (hourly)
Site prep			
Dump truck (tipping fill)	2	107	52.00%
Dozer	2	103	100.00%
Wheeled backhoe loader	2	95	80.00%
Pre-earthworks drainage			
Dump truck (tipping fill)	2	107	55.00%
Dozer	2	103	100.00%
Wheeled loader	2	108	80.00%
Tracked excavator	2	99	83.00%
Road lorry (full)	1	109	10.00%
Water pump	1	93	10.00%
Large concrete mixer	1	104	73.00%
Truck mounted concrete pump + boom arm	1	108	10.00%
Groundwork (excavation and installation of below ground cables ducts and pipes)			
Dump truck (tipping fill)	2	107	55.00%

Source	Number of sources	Sound Power Level dB(A) (including corrections)	Percentage time in use (hourly)
Dozer	2	103	93.00%
Wheeled loader	2	108	80.00%
Tracked excavator	2	99	83.00%
Road lorry (full)	1	109	10.00%
Water pump	1	93	10.00%
Vibratory compacter (asphalt)	1	111	50.00%
Civils piling			
Directional drill (generator)	1	106	50.00%
Mobile telescopic crane	1	99	50.00%
Piling	1	91	83.00%
Rig power pack	1	91	83.00%
Civils (trench excavation and laying concrete foundations)			
Tracked excavator	2	99	83.00%
Large concrete mixer	1	104	73.00%
Truck mounted concrete pump + boom arm	1	108	10.00%
C6.21 Road lorry (full)	2	109	10.00%
C2.45 Water pump	1	93	10.00%
Civils (backfilling)			
Road lorry (full)	1	109	10.00%
Articulated dump truck	2	107	80.00%
Tracked excavator	2	99	83.00%

Source	Number of sources	Sound Power Level dB(A) (including corrections)	Percentage time in use (hourly)
Wheeled backhoe loader	2	97	40.00%
Road roller	2	108	40.00%
C6.31 Grader	2	115	100.00%
Civils (pits, chambers, troughs, trays and ducting)			
Dump truck (tipping fill)	2	107	57.00%
Dozer	2	103	83.00%
Wheeled backhoe loader	2	97	80.00%
Tracked excavator	2	105	40.00%
Road lorry (full)	1	109	10.00%
Water pump	1	93	10.00%
Mobile telescopic crane	1	99	20.00%
Vibratory compacter (asphalt)	1	111	50.00%
Finishing (topsoil replacement and landscape implementation)			
Dump truck (tipping fill)	2	107	52.00%
Dozer	2	103	100.00%
Wheeled backhoe loader	2	95	80.00%
Tracked excavator	2	99	83.00%

4.5 Construction of temporary and permanent access routes for noise assessment

Table 4-5 Plant list for onshore cable installation calculations

Source	Number of sources	Sound Power Level dB(A) (including corrections)	Percentage time in use (hourly)
Excavator	1	99	100.00%
Dumper	1	104	100.00%
Roller	1	102	100.00%

5. Glossary of terms and abbreviations

Table 5-1 Glossary of terms and abbreviations

Term (acronym)	Definition
ADT	Articulated Dump Truck
Baseline conditions	The environment as it appears (or would appear) immediately prior to the implementation of the Proposed Development together with any known or foreseeable future changes that will take place before completion of the Proposed Development.
BS	British Standard
Cumulative effects	Additional changes caused by a Proposed Development in conjunction with other similar developments or as a combined effect of a set of developments.
dB	Decibel
Decommissioning	The period during which a development and its associated processes are removed from active operation.
Environmental Impact Assessment (EIA)	The process of evaluating the likely significant environmental effects of a proposed project or development over and above the existing circumstances (or 'baseline').
Environmental Statement (ES)	The written output presenting the full findings of the Environmental Impact Assessment.
HGV	Heavy Goods Vehicle
Horizontal Directional Drill (HDD)	An engineering technique avoiding open trenches.
MDS	Maximum Design Scenario
PPV	Peak Particle Velocity
Preliminary Environmental Information Report (PEIR)	The written output of the Environmental Impact Assessment undertaken to date for the Proposed Development. It is developed to support formal consultation and presents the preliminary findings of the assessment to allow an informed view to be developed of the Proposed Development, the assessment approach that has been undertaken, and the preliminary conclusions on the likely significant effects of the Proposed Development and environmental measures proposed.

Term (acronym)	Definition
Proposed Development	The development that is subject to the application for development consent, as described in Chapter 4: The Proposed Development, Volume 2 of the ES (Document Reference: 6.2.4).
Receptor	These are as defined in Regulation 5(2) of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 and include population and human health, biodiversity, land, soil, water, air, climate, material assets, cultural heritage and landscape that may be at risk from exposure to pollutants which could potentially arise as a result of the Proposed Development.

6. References

British Standards Institution, (2014a). *BS 5228-1:2009 + A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1: Noise*. London: BSI.

British Standards Institution, (2014b). *BS 5228-2:2009 + A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 2: Vibration*. London: BSI.

International Organisation for Standardisation (ISO) (1996). *9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation*. Geneva; ISO.

