



# **Technical Appendix 9-4 Alternative Turbine Calculations**

**EIAR – Volume 3**

**Muingmore Wind Farm**

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## **RWE Renewables Ireland Limited**

### **Muingmore Wind Farm – Noise and Vibration**

#### **Technical Appendix 9-4 Alternative Turbine Calculations**

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# 1 Introduction

This appendix provides additional information regarding the calculation and assessment of operational noise from alternative candidate wind turbines at the Main Wind Farm Development Site. The EIA Report provides the operational noise impact assessment based on a Nordex N163 7.0 MW candidate wind turbine as it presents a worst case. The other machines assessed are:

- Vestas V150 6.0 MW on a 105 m hub; and
- Nordex N149 5.7 MW on a 104.5 m hub.

# 2 Noise Emission Data

Manufacturer's noise emission<sup>1</sup> data, or sound power data, has been separately provided for either hub height or standardised wind speeds, all of which exclude any margin for uncertainty, and as such an additional 2 dB has been included in all the emission levels. A summary of the overall noise emission data is provided in Table 1, which includes the +2 dB uncertainty. The data used in this assessment for each turbine option is for the standard model which has serrated trailing edges fitted. Where data was supplied using hub height wind reference, it has been standardised to 10 m using the method described in the IOA GPG<sup>2</sup>. Octave band data has also been made available for each of the alternative turbines and is summarised in Table 2, which also includes +2 dB uncertainty.

**Table 1: Overall Wind Turbine Noise Emission Data**

Turbine and mode	Emission Level, dB L <sub>WA</sub> , at Standardised Wind Speed									
	3	4	5	6	7	8	9	10	11	12
N163 Unconstrained <sup>3</sup>	97.8	99.1	103.7	108.1	109.4	109.4	109.4	109.4	109.4	109.4
N163 Mode 9 <sup>3</sup>	97.8	99.1	103.4	103.8	103.8	103.8	103.8	103.8	103.8	103.8
V150 Unconstrained <sup>4</sup>	96.7	98.6	103.5	106.1	106.9	106.9	106.9	106.9	106.9	106.9
N149 Unconstrained <sup>5</sup>	96.0	97.2	101.8	106.2	107.6	107.6	107.6	107.6	107.6	107.6
N149 Mode 5 <sup>5</sup>	96.0	97.2	101.8	105.5	105.5	105.5	105.5	105.5	105.5	105.5

**Table 2: Octave Band Noise Emission Data**

Details	Emission Level, dB L <sub>WA</sub> , at Octave Band Centre Frequency, Hz								
	63	125	250	500	1000	2000	4000	8000	dB(A)
Nordex N163 Mode 0 <sup>3</sup>	90.6	98.2	100.3	101.5	103.3	104.0	98.4	84.0	109.4
Nordex N163 Mode 9 <sup>3</sup>	85.0	92.6	94.7	95.9	97.7	98.4	92.8	78.4	101.8
Vestas V150 <sup>6</sup>	90.9	97.4	98.6	99.2	100.7	100.7	94.4	81.2	106.9
Nordex N149 Mode 0 <sup>6</sup>	89.3	95.5	99.2	101.8	102.5	100.0	92.4	84.4	107.6
Nordex N149 Mode 5 <sup>6</sup>	86.8	93.4	97.1	99.2	100.5	98.6	89.0	81.1	105.5

<sup>1</sup> The term 'noise emission' relates to the sound power level of a wind turbine

<sup>2</sup> Institute of Acoustics 'A Good Practice Guide to the Application of ETSU-R-97 for the Assessment and Rating of Wind Turbine Noise' Supplementary Guidance Note 4: Wind Shear, Equation 1 'log-law' equation with a standard roughness z<sub>0</sub> of 0.05 m.

<sup>3</sup> Nordex document F008\_277\_A17\_EN Revision 09, 13 October 2023

<sup>4</sup> Vestas document 0098-0749 V05, 31 October 2024

<sup>5</sup> Nordex document F008\_275\_A17\_EN Revision 05, 4 December 2023

<sup>6</sup> Vestas document 0095-3747 V02 20 November 2024

Table 1 includes noise emission data for each operational mode considered in the assessment. For the cases of the Nordex N163 and the Nordex N149, operating all turbines in their unconstrained mode resulted in a breach in noise limit at one or more Noise Sensitive Receptors (NSRs) at 6 m/s only. Therefore, noise reduced modes are necessary for turbines: T8 and T9 at this wind speed for the N163 turbine option and T8 at this wind speed for the N149 turbine option.

## 3 Results

### 3.1 Nordex N163

The Nordex N163 operating in unconstrained mode resulted in the highest noise immission<sup>7</sup> level at the NSRs, which is the reason why it was selected as the overall candidate machine in the assessment. The EIA Report Chapter 9 presents the assessment for the N163 machine.

### 3.2 Vestas V150

The alternative assessment using the Vestas V150 as the candidate machine is presented in Table 3. This assumes that all turbines are operating in unconstrained mode.

**Table 3: Alternative Assessment of Wind Farm Noise Immission Levels – Vestas V150**

NSR ID	Description	Standardised wind speed, m/s. Noise level dB L <sub>A90</sub>						
		4	5	6	7	8	9	≥10
NSR01	Wind turbine immission	18.3	23.2	25.8	26.6	26.6	26.6	26.6
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	48.2
	<b>Daytime exceedance</b>	<b>-21.7</b>	<b>-16.8</b>	<b>-14.2</b>	<b>-18.4</b>	<b>-18.4</b>	<b>-18.4</b>	<b>-21.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-24.7</b>	<b>-19.8</b>	<b>-17.2</b>	<b>-16.4</b>	<b>-16.4</b>	<b>-16.4</b>	<b>-16.4</b>
NSR02	Wind turbine immission	28.4	33.3	35.9	36.7	36.7	36.7	36.7
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	48.2
	<b>Daytime exceedance</b>	<b>-11.6</b>	<b>-6.7</b>	<b>-4.1</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-11.5</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-14.6</b>	<b>-9.7</b>	<b>-7.1</b>	<b>-6.3</b>	<b>-6.3</b>	<b>-6.3</b>	<b>-6.3</b>
NSR03	Wind turbine immission	32.2	37.1	39.7	40.5	40.5	40.5	40.5
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-7.8</b>	<b>-7.9</b>	<b>-5.3</b>	<b>-9.0</b>	<b>-13.7</b>	<b>-16.7</b>	<b>-18.0</b>
	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7
	<b>Night-time exceedance</b>	<b>-10.8</b>	<b>-5.9</b>	<b>-3.3</b>	<b>-4.8</b>	<b>-11.0</b>	<b>-16.2</b>	<b>-16.2</b>
NSR04	Wind turbine immission	29.4	34.3	36.9	37.7	37.7	37.7	37.7
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-10.6</b>	<b>-10.7</b>	<b>-8.1</b>	<b>-11.8</b>	<b>-16.5</b>	<b>-19.5</b>	<b>-20.8</b>
	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7

<sup>7</sup> The term 'noise immission' relates to the sound pressure level experienced at a receptor location

	<b>Night-time exceedance</b>	<b>-13.6</b>	<b>-8.7</b>	<b>-6.1</b>	<b>-7.6</b>	<b>-13.8</b>	<b>-19.0</b>	<b>-19.0</b>
NSR05	Wind turbine immission	30.8	35.7	38.3	39.1	39.1	39.1	39.1
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-9.2</b>	<b>-9.3</b>	<b>-6.7</b>	<b>-10.4</b>	<b>-15.1</b>	<b>-18.1</b>	<b>-19.4</b>
	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7
	<b>Night-time exceedance</b>	<b>-12.2</b>	<b>-7.3</b>	<b>-4.7</b>	<b>-6.2</b>	<b>-12.4</b>	<b>-17.6</b>	<b>-17.6</b>
NSR06	Wind turbine immission	29.8	34.7	37.3	38.1	38.1	38.1	38.1
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-10.2</b>	<b>-10.3</b>	<b>-7.7</b>	<b>-7.0</b>	<b>-10.2</b>	<b>-12.2</b>	<b>-12.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-13.2</b>	<b>-8.3</b>	<b>-5.7</b>	<b>-4.9</b>	<b>-4.9</b>	<b>-9.9</b>	<b>-9.9</b>
NSR07	Wind turbine immission	30.0	34.9	37.5	38.3	38.3	38.3	38.3
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-10.0</b>	<b>-10.1</b>	<b>-7.5</b>	<b>-6.8</b>	<b>-10.0</b>	<b>-12.0</b>	<b>-12.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-13.0</b>	<b>-8.1</b>	<b>-5.5</b>	<b>-4.7</b>	<b>-4.7</b>	<b>-9.7</b>	<b>-9.7</b>
NSR08	Wind turbine immission	29.8	34.7	37.3	38.1	38.1	38.1	38.1
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-10.2</b>	<b>-10.3</b>	<b>-7.7</b>	<b>-7.0</b>	<b>-10.2</b>	<b>-12.2</b>	<b>-12.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-13.2</b>	<b>-8.3</b>	<b>-5.7</b>	<b>-4.9</b>	<b>-4.9</b>	<b>-9.9</b>	<b>-9.9</b>
NSR09	Wind turbine immission	27.0	31.9	34.5	35.3	35.3	35.3	35.3
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-13.0</b>	<b>-13.1</b>	<b>-10.5</b>	<b>-9.8</b>	<b>-13.0</b>	<b>-15.0</b>	<b>-15.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-16.0</b>	<b>-11.1</b>	<b>-8.5</b>	<b>-7.7</b>	<b>-7.7</b>	<b>-12.7</b>	<b>-12.7</b>
NSR10	Wind turbine immission	25.6	30.5	33.1	33.9	33.9	33.9	33.9
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-14.4</b>	<b>-14.5</b>	<b>-11.9</b>	<b>-11.2</b>	<b>-14.4</b>	<b>-16.4</b>	<b>-16.8</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-17.4</b>	<b>-12.5</b>	<b>-9.9</b>	<b>-9.1</b>	<b>-9.1</b>	<b>-14.1</b>	<b>-14.1</b>
NSR11	Wind turbine immission	28.7	33.6	36.2	37.0	37.0	37.0	37.0
	Daytime limit	40.0	40.0	45.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-11.3</b>	<b>-6.4</b>	<b>-8.8</b>	<b>-8.0</b>	<b>-8.0</b>	<b>-8.0</b>	<b>-8.0</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-14.3</b>	<b>-9.4</b>	<b>-6.8</b>	<b>-6.0</b>	<b>-6.0</b>	<b>-6.0</b>	<b>-6.0</b>
NSR12	Wind turbine immission	30.2	35.1	37.7	38.5	38.5	38.5	38.5

	Daytime limit	40.0	40.0	45.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-9.8</b>	<b>-4.9</b>	<b>-7.3</b>	<b>-6.5</b>	<b>-6.5</b>	<b>-6.5</b>	<b>-6.5</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-12.8</b>	<b>-7.9</b>	<b>-5.3</b>	<b>-4.5</b>	<b>-4.5</b>	<b>-4.5</b>	<b>-4.5</b>
NSR13	Wind turbine immission	32.2	37.1	39.7	40.5	40.5	40.5	40.5
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-7.8</b>	<b>-2.9</b>	<b>-0.3</b>	<b>-4.5</b>	<b>-4.5</b>	<b>-4.5</b>	<b>-4.5</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-10.8</b>	<b>-5.9</b>	<b>-3.3</b>	<b>-2.5</b>	<b>-2.5</b>	<b>-2.5</b>	<b>-2.5</b>
NSR14	Wind turbine immission	31.5	36.4	39.0	39.8	39.8	39.8	39.8
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-8.5</b>	<b>-3.6</b>	<b>-1.0</b>	<b>-5.2</b>	<b>-5.2</b>	<b>-5.2</b>	<b>-5.2</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-11.5</b>	<b>-6.6</b>	<b>-4.0</b>	<b>-3.2</b>	<b>-3.2</b>	<b>-3.2</b>	<b>-3.2</b>
NSR15	Wind turbine immission	31.3	36.2	38.8	39.6	39.6	39.6	39.6
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-8.7</b>	<b>-3.8</b>	<b>-1.2</b>	<b>-5.4</b>	<b>-5.4</b>	<b>-5.4</b>	<b>-5.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-11.7</b>	<b>-6.8</b>	<b>-4.2</b>	<b>-3.4</b>	<b>-3.4</b>	<b>-3.4</b>	<b>-3.4</b>
NSR16	Wind turbine immission	30.4	35.3	37.9	38.7	38.7	38.7	38.7
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-9.6</b>	<b>-4.7</b>	<b>-2.1</b>	<b>-6.3</b>	<b>-6.3</b>	<b>-6.3</b>	<b>-6.3</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-12.6</b>	<b>-7.7</b>	<b>-5.1</b>	<b>-4.3</b>	<b>-4.3</b>	<b>-4.3</b>	<b>-4.3</b>
NSR17	Wind turbine immission	27.3	32.2	34.8	35.6	35.6	35.6	35.6
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-12.7</b>	<b>-7.8</b>	<b>-5.2</b>	<b>-9.4</b>	<b>-9.4</b>	<b>-9.4</b>	<b>-9.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-15.7</b>	<b>-10.8</b>	<b>-8.2</b>	<b>-7.4</b>	<b>-7.4</b>	<b>-7.4</b>	<b>-7.4</b>
NSR18	Wind turbine immission	27.2	32.1	34.7	35.5	35.5	35.5	35.5
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-12.8</b>	<b>-7.9</b>	<b>-5.3</b>	<b>-9.5</b>	<b>-9.5</b>	<b>-9.5</b>	<b>-9.5</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-15.8</b>	<b>-10.9</b>	<b>-8.3</b>	<b>-7.5</b>	<b>-7.5</b>	<b>-7.5</b>	<b>-7.5</b>
NSR19	Wind turbine immission	26.0	30.9	33.5	34.3	34.3	34.3	34.3
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-14.0</b>	<b>-9.1</b>	<b>-6.5</b>	<b>-10.7</b>	<b>-10.7</b>	<b>-10.7</b>	<b>-10.7</b>

	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-17.0</b>	<b>-12.1</b>	<b>-9.5</b>	<b>-8.7</b>	<b>-8.7</b>	<b>-8.7</b>	<b>-8.7</b>
NSR20	Wind turbine immission	26.4	31.3	33.9	34.7	34.7	34.7	34.7
	Daytime limit	40.0	45.0	45.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-13.6</b>	<b>-13.7</b>	<b>-11.1</b>	<b>-10.3</b>	<b>-10.3</b>	<b>-10.3</b>	<b>-10.3</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-16.6</b>	<b>-11.7</b>	<b>-9.1</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-8.3</b>

### 3.3 Nordex N149

The alternative assessment using the Nordex N149 as the candidate machine is presented in Table 4. This assumes that all turbines are operating in unconstrained mode.

**Table 4: Alternative Assessment of Wind Farm Noise Immission Levels – Nordex N149 (unconstrained)**

NSR ID	Description	Standardised wind speed, m/s. Noise level dB L <sub>A90</sub>						
		4	5	6	7	8	9	≥10
NSR01	Wind turbine immission	18.4	23.0	27.4	28.8	28.8	28.8	28.8
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	48.2
	<b>Daytime exceedance</b>	<b>-21.6</b>	<b>-17.0</b>	<b>-12.6</b>	<b>-16.2</b>	<b>-16.2</b>	<b>-16.2</b>	<b>-19.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-24.6</b>	<b>-20.0</b>	<b>-15.6</b>	<b>-14.2</b>	<b>-14.2</b>	<b>-14.2</b>	<b>-14.2</b>
NSR02	Wind turbine immission	27.2	31.8	36.2	37.6	37.6	37.6	37.6
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	48.2
	<b>Daytime exceedance</b>	<b>-12.8</b>	<b>-8.2</b>	<b>-3.8</b>	<b>-7.4</b>	<b>-7.4</b>	<b>-7.4</b>	<b>-10.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-15.8</b>	<b>-11.2</b>	<b>-6.8</b>	<b>-5.4</b>	<b>-5.4</b>	<b>-5.4</b>	<b>-5.4</b>
NSR03	Wind turbine immission	31.1	35.7	40.1	41.5	41.5	41.5	41.5
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-8.9</b>	<b>-9.3</b>	<b>-4.9</b>	<b>-8.0</b>	<b>-12.7</b>	<b>-15.7</b>	<b>-17.0</b>
	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7
	<b>Night-time exceedance</b>	<b>-11.9</b>	<b>-7.3</b>	<b>-2.9</b>	<b>-3.8</b>	<b>-10.0</b>	<b>-15.2</b>	<b>-15.2</b>
NSR04	Wind turbine immission	28.2	32.8	37.2	38.6	38.6	38.6	38.6
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-11.8</b>	<b>-12.2</b>	<b>-7.8</b>	<b>-10.9</b>	<b>-15.6</b>	<b>-18.6</b>	<b>-19.9</b>
	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7
	<b>Night-time exceedance</b>	<b>-14.8</b>	<b>-10.2</b>	<b>-5.8</b>	<b>-6.7</b>	<b>-12.9</b>	<b>-18.1</b>	<b>-18.1</b>
NSR05	Wind turbine immission	29.6	34.2	38.6	40.0	40.0	40.0	40.0
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-10.4</b>	<b>-10.8</b>	<b>-6.4</b>	<b>-9.5</b>	<b>-14.2</b>	<b>-17.2</b>	<b>-18.5</b>

	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7
	<b>Night-time exceedance</b>	<b>-13.4</b>	<b>-8.8</b>	<b>-4.4</b>	<b>-5.3</b>	<b>-11.5</b>	<b>-16.7</b>	<b>-16.7</b>
NSR06	Wind turbine immission	28.7	33.3	37.7	39.1	39.1	39.1	39.1
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-11.3</b>	<b>-11.7</b>	<b>-7.3</b>	<b>-6.0</b>	<b>-9.2</b>	<b>-11.2</b>	<b>-11.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-14.3</b>	<b>-9.7</b>	<b>-5.3</b>	<b>-3.9</b>	<b>-3.9</b>	<b>-8.9</b>	<b>-8.9</b>
NSR07	Wind turbine immission	28.9	33.5	37.9	39.3	39.3	39.3	39.3
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-11.1</b>	<b>-11.5</b>	<b>-7.1</b>	<b>-5.8</b>	<b>-9.0</b>	<b>-11.0</b>	<b>-11.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-14.1</b>	<b>-9.5</b>	<b>-5.1</b>	<b>-3.7</b>	<b>-3.7</b>	<b>-8.7</b>	<b>-8.7</b>
NSR08	Wind turbine immission	28.7	33.3	37.7	39.1	39.1	39.1	39.1
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-11.3</b>	<b>-11.7</b>	<b>-7.3</b>	<b>-6.0</b>	<b>-9.2</b>	<b>-11.2</b>	<b>-11.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-14.3</b>	<b>-9.7</b>	<b>-5.3</b>	<b>-3.9</b>	<b>-3.9</b>	<b>-8.9</b>	<b>-8.9</b>
NSR09	Wind turbine immission	25.7	30.3	34.7	36.1	36.1	36.1	36.1
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-14.3</b>	<b>-14.7</b>	<b>-10.3</b>	<b>-9.0</b>	<b>-12.2</b>	<b>-14.2</b>	<b>-14.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-17.3</b>	<b>-12.7</b>	<b>-8.3</b>	<b>-6.9</b>	<b>-6.9</b>	<b>-11.9</b>	<b>-11.9</b>
NSR10	Wind turbine immission	24.3	28.9	33.3	34.7	34.7	34.7	34.7
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-15.7</b>	<b>-16.1</b>	<b>-11.7</b>	<b>-10.4</b>	<b>-13.6</b>	<b>-15.6</b>	<b>-16.0</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-18.7</b>	<b>-14.1</b>	<b>-9.7</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-13.3</b>	<b>-13.3</b>
NSR11	Wind turbine immission	27.5	32.1	36.5	37.9	37.9	37.9	37.9
	Daytime limit	40.0	40.0	45.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-12.5</b>	<b>-7.9</b>	<b>-8.5</b>	<b>-7.1</b>	<b>-7.1</b>	<b>-7.1</b>	<b>-7.1</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-15.5</b>	<b>-10.9</b>	<b>-6.5</b>	<b>-5.1</b>	<b>-5.1</b>	<b>-5.1</b>	<b>-5.1</b>
NSR12	Wind turbine immission	29.1	33.7	38.1	39.5	39.5	39.5	39.5
	Daytime limit	40.0	40.0	45.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-10.9</b>	<b>-6.3</b>	<b>-6.9</b>	<b>-5.5</b>	<b>-5.5</b>	<b>-5.5</b>	<b>-5.5</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-13.9</b>	<b>-9.3</b>	<b>-4.9</b>	<b>-3.5</b>	<b>-3.5</b>	<b>-3.5</b>	<b>-3.5</b>

NSR13	Wind turbine immission	31.1	35.7	40.1	41.5	41.5	41.5	41.5
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-8.9</b>	<b>-4.3</b>	<b>0.1</b>	<b>-3.5</b>	<b>-3.5</b>	<b>-3.5</b>	<b>-3.5</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-11.9</b>	<b>-7.3</b>	<b>-2.9</b>	<b>-1.5</b>	<b>-1.5</b>	<b>-1.5</b>	<b>-1.5</b>
NSR14	Wind turbine immission	30.3	34.9	39.3	40.7	40.7	40.7	40.7
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-9.7</b>	<b>-5.1</b>	<b>-0.7</b>	<b>-4.3</b>	<b>-4.3</b>	<b>-4.3</b>	<b>-4.3</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-12.7</b>	<b>-8.1</b>	<b>-3.7</b>	<b>-2.3</b>	<b>-2.3</b>	<b>-2.3</b>	<b>-2.3</b>
NSR15	Wind turbine immission	30.2	34.8	39.2	40.6	40.6	40.6	40.6
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-9.8</b>	<b>-5.2</b>	<b>-0.8</b>	<b>-4.4</b>	<b>-4.4</b>	<b>-4.4</b>	<b>-4.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-12.8</b>	<b>-8.2</b>	<b>-3.8</b>	<b>-2.4</b>	<b>-2.4</b>	<b>-2.4</b>	<b>-2.4</b>
NSR16	Wind turbine immission	29.2	33.8	38.2	39.6	39.6	39.6	39.6
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-10.8</b>	<b>-6.2</b>	<b>-1.8</b>	<b>-5.4</b>	<b>-5.4</b>	<b>-5.4</b>	<b>-5.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-13.8</b>	<b>-9.2</b>	<b>-4.8</b>	<b>-3.4</b>	<b>-3.4</b>	<b>-3.4</b>	<b>-3.4</b>
NSR17	Wind turbine immission	26.1	30.7	35.1	36.5	36.5	36.5	36.5
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-13.9</b>	<b>-9.3</b>	<b>-4.9</b>	<b>-8.5</b>	<b>-8.5</b>	<b>-8.5</b>	<b>-8.5</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-16.9</b>	<b>-12.3</b>	<b>-7.9</b>	<b>-6.5</b>	<b>-6.5</b>	<b>-6.5</b>	<b>-6.5</b>
NSR18	Wind turbine immission	26.0	30.6	35.0	36.4	36.4	36.4	36.4
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-14.0</b>	<b>-9.4</b>	<b>-5.0</b>	<b>-8.6</b>	<b>-8.6</b>	<b>-8.6</b>	<b>-8.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-17.0</b>	<b>-12.4</b>	<b>-8.0</b>	<b>-6.6</b>	<b>-6.6</b>	<b>-6.6</b>	<b>-6.6</b>
NSR19	Wind turbine immission	24.7	29.3	33.7	35.1	35.1	35.1	35.1
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-15.3</b>	<b>-10.7</b>	<b>-6.3</b>	<b>-9.9</b>	<b>-9.9</b>	<b>-9.9</b>	<b>-9.9</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-18.3</b>	<b>-13.7</b>	<b>-9.3</b>	<b>-7.9</b>	<b>-7.9</b>	<b>-7.9</b>	<b>-7.9</b>
NSR20	Wind turbine immission	27.3	29.8	34.2	35.6	35.6	35.6	35.6
	Daytime limit	40.0	45.0	45.0	45.0	45.0	45.0	45.0

<b>Daytime exceedance</b>	<b>-12.7</b>	<b>-15.2</b>	<b>-10.8</b>	<b>-9.4</b>	<b>-9.4</b>	<b>-9.4</b>	<b>-9.4</b>
Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
<b>Night-time exceedance</b>	<b>-15.7</b>	<b>-13.2</b>	<b>-8.8</b>	<b>-7.4</b>	<b>-7.4</b>	<b>-7.4</b>	<b>-7.4</b>

It can be seen from Table 4 that the daytime noise limit at NSR13 for a wind speed of 6 m/s is exceeded by 0.1 dB when all turbines operate in their unconstrained mode (highlighted in yellow). At all other NSRs, and for all other windspeeds and times of the day, the noise limit is not exceeded. Mitigation has therefore been considered for the N149 turbine option. Table 5 provides the assessment of the N149 turbine with T8 operating in noise reduced Mode 5 at 6 m/s wind speed only.

**Table 5: Alternative Assessment of Wind Farm Noise Immission Levels – Nordex N149 (with constraint)**

NSR ID	Description	Standardised wind speed, m/s. Noise level dB L <sub>A90</sub>						
		4	5	6	7	8	9	≥10
NSR01	Wind turbine immission	16.8	21.4	27.4	27.2	27.2	27.2	27.2
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	48.2
	<b>Daytime exceedance</b>	<b>-23.2</b>	<b>-18.6</b>	<b>-12.6</b>	<b>-17.8</b>	<b>-17.8</b>	<b>-17.8</b>	<b>-21.0</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-26.2</b>	<b>-21.6</b>	<b>-15.6</b>	<b>-15.8</b>	<b>-15.8</b>	<b>-15.8</b>	<b>-15.8</b>
NSR02	Wind turbine immission	27.4	32.0	36.1	37.8	37.8	37.8	37.8
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	48.2
	<b>Daytime exceedance</b>	<b>-12.6</b>	<b>-8.0</b>	<b>-3.9</b>	<b>-7.2</b>	<b>-7.2</b>	<b>-7.2</b>	<b>-10.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-15.6</b>	<b>-11.0</b>	<b>-6.9</b>	<b>-5.2</b>	<b>-5.2</b>	<b>-5.2</b>	<b>-5.2</b>
NSR03	Wind turbine immission	31.3	35.9	40.1	41.7	41.7	41.7	41.7
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-8.7</b>	<b>-9.1</b>	<b>-4.9</b>	<b>-7.8</b>	<b>-12.5</b>	<b>-15.5</b>	<b>-16.8</b>
	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7
	<b>Night-time exceedance</b>	<b>-11.7</b>	<b>-7.1</b>	<b>-2.9</b>	<b>-3.6</b>	<b>-9.8</b>	<b>-15.0</b>	<b>-15.0</b>
NSR04	Wind turbine immission	28.5	33.1	37.2	38.9	38.9	38.9	38.9
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-11.5</b>	<b>-11.9</b>	<b>-7.8</b>	<b>-10.6</b>	<b>-15.3</b>	<b>-18.3</b>	<b>-19.6</b>
	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7
	<b>Night-time exceedance</b>	<b>-14.5</b>	<b>-9.9</b>	<b>-5.8</b>	<b>-6.4</b>	<b>-12.6</b>	<b>-17.8</b>	<b>-17.8</b>
NSR05	Wind turbine immission	29.9	34.5	38.6	40.3	40.3	40.3	40.3
	Daytime limit	40.0	45.0	45.0	49.5	54.2	57.2	58.5
	<b>Daytime exceedance</b>	<b>-10.1</b>	<b>-10.5</b>	<b>-6.4</b>	<b>-9.2</b>	<b>-13.9</b>	<b>-16.9</b>	<b>-18.2</b>
	Night-time limit	43.0	43.0	43.0	45.3	51.5	56.7	56.7
	<b>Night-time exceedance</b>	<b>-13.1</b>	<b>-8.5</b>	<b>-4.4</b>	<b>-5.0</b>	<b>-11.2</b>	<b>-16.4</b>	<b>-16.4</b>

NSR06	Wind turbine immission	28.9	33.5	37.6	39.3	39.3	39.3	39.3
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-11.1</b>	<b>-11.5</b>	<b>-7.4</b>	<b>-5.8</b>	<b>-9.0</b>	<b>-11.0</b>	<b>-11.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-14.1</b>	<b>-9.5</b>	<b>-5.4</b>	<b>-3.7</b>	<b>-3.7</b>	<b>-8.7</b>	<b>-8.7</b>
NSR07	Wind turbine immission	29.1	33.7	37.8	39.5	39.5	39.5	39.5
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-10.9</b>	<b>-11.3</b>	<b>-7.2</b>	<b>-5.6</b>	<b>-8.8</b>	<b>-10.8</b>	<b>-11.2</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-13.9</b>	<b>-9.3</b>	<b>-5.2</b>	<b>-3.5</b>	<b>-3.5</b>	<b>-8.5</b>	<b>-8.5</b>
NSR08	Wind turbine immission	28.9	33.5	37.6	39.3	39.3	39.3	39.3
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-11.1</b>	<b>-11.5</b>	<b>-7.4</b>	<b>-5.8</b>	<b>-9.0</b>	<b>-11.0</b>	<b>-11.4</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-14.1</b>	<b>-9.5</b>	<b>-5.4</b>	<b>-3.7</b>	<b>-3.7</b>	<b>-8.7</b>	<b>-8.7</b>
NSR09	Wind turbine immission	26.0	30.6	34.7	36.4	36.4	36.4	36.4
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-14.0</b>	<b>-14.4</b>	<b>-10.3</b>	<b>-8.7</b>	<b>-11.9</b>	<b>-13.9</b>	<b>-14.3</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-17.0</b>	<b>-12.4</b>	<b>-8.3</b>	<b>-6.6</b>	<b>-6.6</b>	<b>-11.6</b>	<b>-11.6</b>
NSR10	Wind turbine immission	24.6	29.2	33.2	35.0	35.0	35.0	35.0
	Daytime limit	40.0	45.0	45.0	45.1	48.3	50.3	50.7
	<b>Daytime exceedance</b>	<b>-15.4</b>	<b>-15.8</b>	<b>-11.8</b>	<b>-10.1</b>	<b>-13.3</b>	<b>-15.3</b>	<b>-15.7</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	48.0	48.0
	<b>Night-time exceedance</b>	<b>-18.4</b>	<b>-13.8</b>	<b>-9.8</b>	<b>-8.0</b>	<b>-8.0</b>	<b>-13.0</b>	<b>-13.0</b>
NSR11	Wind turbine immission	27.8	32.4	36.4	38.2	38.2	38.2	38.2
	Daytime limit	40.0	40.0	45.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-12.2</b>	<b>-7.6</b>	<b>-8.6</b>	<b>-6.8</b>	<b>-6.8</b>	<b>-6.8</b>	<b>-6.8</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-15.2</b>	<b>-10.6</b>	<b>-6.6</b>	<b>-4.8</b>	<b>-4.8</b>	<b>-4.8</b>	<b>-4.8</b>
NSR12	Wind turbine immission	29.3	33.9	38.0	39.7	39.7	39.7	39.7
	Daytime limit	40.0	40.0	45.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-10.7</b>	<b>-6.1</b>	<b>-7.0</b>	<b>-5.3</b>	<b>-5.3</b>	<b>-5.3</b>	<b>-5.3</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-13.7</b>	<b>-9.1</b>	<b>-5.0</b>	<b>-3.3</b>	<b>-3.3</b>	<b>-3.3</b>	<b>-3.3</b>
NSR13	Wind turbine immission	31.3	35.9	39.9	41.7	41.7	41.7	41.7
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0

	<b>Daytime exceedance</b>	<b>-8.7</b>	<b>-4.1</b>	<b>-0.1</b>	<b>-3.3</b>	<b>-3.3</b>	<b>-3.3</b>	<b>-3.3</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-11.7</b>	<b>-7.1</b>	<b>-3.1</b>	<b>-1.3</b>	<b>-1.3</b>	<b>-1.3</b>	<b>-1.3</b>
NSR14	Wind turbine immission	30.6	35.2	39.1	41.0	41.0	41.0	41.0
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-9.4</b>	<b>-4.8</b>	<b>-0.9</b>	<b>-4.0</b>	<b>-4.0</b>	<b>-4.0</b>	<b>-4.0</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-12.4</b>	<b>-7.8</b>	<b>-3.9</b>	<b>-2.0</b>	<b>-2.0</b>	<b>-2.0</b>	<b>-2.0</b>
NSR15	Wind turbine immission	30.5	35.1	39.0	40.9	40.9	40.9	40.9
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-9.5</b>	<b>-4.9</b>	<b>-1.0</b>	<b>-4.1</b>	<b>-4.1</b>	<b>-4.1</b>	<b>-4.1</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-12.5</b>	<b>-7.9</b>	<b>-4.0</b>	<b>-2.1</b>	<b>-2.1</b>	<b>-2.1</b>	<b>-2.1</b>
NSR16	Wind turbine immission	29.5	34.1	38.1	39.9	39.9	39.9	39.9
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-10.5</b>	<b>-5.9</b>	<b>-1.9</b>	<b>-5.1</b>	<b>-5.1</b>	<b>-5.1</b>	<b>-5.1</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-13.5</b>	<b>-8.9</b>	<b>-4.9</b>	<b>-3.1</b>	<b>-3.1</b>	<b>-3.1</b>	<b>-3.1</b>
NSR17	Wind turbine immission	26.3	30.9	35.0	36.7	36.7	36.7	36.7
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-13.7</b>	<b>-9.1</b>	<b>-5.0</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-8.3</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-16.7</b>	<b>-12.1</b>	<b>-8.0</b>	<b>-6.3</b>	<b>-6.3</b>	<b>-6.3</b>	<b>-6.3</b>
NSR18	Wind turbine immission	26.3	30.9	34.9	36.7	36.7	36.7	36.7
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-13.7</b>	<b>-9.1</b>	<b>-5.1</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-8.3</b>	<b>-8.3</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-16.7</b>	<b>-12.1</b>	<b>-8.1</b>	<b>-6.3</b>	<b>-6.3</b>	<b>-6.3</b>	<b>-6.3</b>
NSR19	Wind turbine immission	25.0	29.6	33.7	35.4	35.4	35.4	35.4
	Daytime limit	40.0	40.0	40.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-15.0</b>	<b>-10.4</b>	<b>-6.3</b>	<b>-9.6</b>	<b>-9.6</b>	<b>-9.6</b>	<b>-9.6</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0
	<b>Night-time exceedance</b>	<b>-18.0</b>	<b>-13.4</b>	<b>-9.3</b>	<b>-7.6</b>	<b>-7.6</b>	<b>-7.6</b>	<b>-7.6</b>
NSR20	Wind turbine immission	27.6	30.1	34.2	35.9	35.9	35.9	35.9
	Daytime limit	40.0	45.0	45.0	45.0	45.0	45.0	45.0
	<b>Daytime exceedance</b>	<b>-12.4</b>	<b>-14.9</b>	<b>-10.8</b>	<b>-9.1</b>	<b>-9.1</b>	<b>-9.1</b>	<b>-9.1</b>
	Night-time limit	43.0	43.0	43.0	43.0	43.0	43.0	43.0

	<b>Night-time exceedance</b>	<b>-15.4</b>	<b>-12.9</b>	<b>-8.8</b>	<b>-7.1</b>	<b>-7.1</b>	<b>-7.1</b>	<b>-7.1</b>
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## 4 Summary

This Appendix presents the assessment of two alternative candidate turbines: Vestas V150 6 MW; and Nordex N149 5.7 MW. It is demonstrated that the V150 and the N149 can operate within the noise limits.