



# ENVIRONMENTAL STATEMENT – VOLUME 3 – APPENDIX 7.1

## Construction Noise and Vibration Assumptions

Drax Bioenergy with Carbon Capture and Storage

The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations, 2009 –  
Regulation (5(2)(a))

Document Reference Number: 6.3.7.1

Applicant: Drax Power Limited

PINS Reference: EN010120



REVISION: 01

DATE: May 2022

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PUBLIC

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# 1. CONSTRUCTION ASSUMPTIONS

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## 1.1. PLANT ASSUMPTIONS

1.1.1. The following assumptions are with regards to plant:

- a. All plant on site operates 100% on-time;
- b. There are three key construction activities assumed: earthwork, piling (civil works), and general construction (installation of carbon capture technology); and
- c. Locations were assumed for activities, shown in **Plate 1.1**.

## 1.2. VIBRATION ASSUMPTIONS

1.2.1. The following assumptions are with regards to construction vibration:

- a. Distance from closest sensitive receptor to construction area limits where vibration is generated – 900 m;
- b. Nominal hammer energy in joules for hammer in use in piling – 85000 W;
- c. Scaling factor depending on ground conditions for percussive piling set to 3;
- d. Scaling factor depending on probability of predicted value being exceeded for vibratory piling set to 126; and
- e. Vibratory roller and compactor data from TRL 429, shown in **Table 1.1**.

**Table 1.1 -TRL 429 Vibratory Roller and Compactor Data**

Plant Model	Type	Number of Drums	Drum Width (m)	Mass per m width (kg/m)		High Setting		
				Front	Rear	Amplitude of drum vibration (mm)	Frequency (Hz)	Centrifugal Force (kN)
Boomag BW161AD	Twin smooth drum roller – JCB size	2	1.68	2680	2740	0.91	30	58

### 1.3. NOISE ASSUMPTIONS

1.3.1 The following tables show on site plant generated noise levels associated with plant activity stages with reference to BS 5228:2009+A1:2014.

**Table 1.2 - On site Earthworks Noise Level Summary**

Plant Description	BS 5228 Reference	L <sub>Aeq,12h</sub> @ 10m dB from plant	Number of Items	Number of Items Correction dB	Resultant L <sub>Aeq,12h</sub> @ 10m dB from plant items
20 t excavator	C.02 #21	71	5	7	78
35 t road-based wagon	C.02 #30	79	1	0	79
14 t general excavator	C.02 #25	69	6	8	77
D4 and D6 bull dozers	C.02 #12	81	2	3	84
10 & 20 t compaction vibrating rollers	C.05 #20	75	2	3	78

**Table 1.3 - On site Piling Noise Level Summary**

Plant Description	BS 5228 Reference	L <sub>Aeq,12h</sub> @ 10m dB from plant	Number of Items	Number of Items Correction dB	Resultant L <sub>Aeq,12h</sub> @ 10m dB from plant items
Hydraulic hammer piling	C.03 #2	90	4	6	96
Sheet piling	C.03 #9	63	2	3	66

**Table 1.4 - General Construction Noise Level Summary**

<b>Plant Description</b>	<b>BS 5228 Reference</b>	<b>L<sub>Aeq,12h</sub> @ 10m dB from plant</b>	<b>Number of Items</b>	<b>Number of Items Correction dB</b>	<b>Resultant L<sub>Aeq,12h</sub> @ 10m dB from plant items</b>
600 t crawler crane	C.04 #50	71	1	0	71
General craneage	C.03 #29	70	1	0	70
Concrete delivery wagon	C.04 #21	77	1	0	77
Welding and cutting piles	C.03 #32	73	1	0	73

1.3.1. **Plate 1.1** shows the construction areas, with the bore piling area indicated in green, sheet piling area indicated in blue, and the earthworks and general construction area indicated in yellow.

**Plate 1.1 - Construction Area Layout**



**1.4. MODEL CONFIGURATION ASSUMPTIONS**

- 1.4.1. The following CadnaA configuration settings were assumed:
- a. Calculations were set to industrial noise, in accordance with ISO BS5228-1:2009+A1:2014 – Code of Practice of noise and vibration control on construction and open sites;
  - b. Default ground absorption setting was set to 50%; and
  - c. The maximum order of reflections was set to a value of two.