

Outer Dowsing Offshore Wind

Environmental Statement

Chapter 26 Noise and Vibration

Volume 3 Appendices

Appendix 26.3 Construction Plant List

Date: March 2024

Document Reference: 6.3/26.3
Pursuant to APFP Regulation: 5(2)(a)
Rev: 1.0

Company:	Outer Dowsing Offshore Wind	Asset:	Whole Asset			
Project:	Whole Wind Farm	Sub Project/Package:	Whole Asset			
Document Title or Description:	Appendix 26.3 Construction Plant List					
Internal Document Number:	PP1-ODOW-DEV-CS-REP-0134	3 rd Party Doc No (If applicable):	N/A			
Outer Dowsing Offshore Wind accepts no liability for the accuracy or completeness of the information in this document nor for any loss or damage arising from the use of such information.						
Rev No.	Date	Status / Reason for Issue	Author	Checked by	Reviewed by	Approved by
1.0	March 2024	DCO Application	SLR	SLR	Shepherd and Wedderburn	Outer Dowsing



Volume 3, Appendix 26.3 – Construction Plant List

Outer Dowsing Offshore Wind Environmental Statement

GoBe Consultants Ltd

Prepared by:

SLR Consulting Limited

3rd Floor, Brew House, Jacob Street, Tower Hill, Bristol, BS2 0EQ

SLR Project No.: 410.V05356.00013

1 March 2024

Revision: FINAL

Revision Record

Revision	Date	Prepared By	Checked By	Authorised By
01	1 March 2024	SLR	GoBe	ODOW

Basis of Report

This document has been prepared by SLR Consulting Limited (SLR) with reasonable skill, care and diligence, and taking account of the timescales and resources devoted to it by agreement with GoBe Consultants Ltd (the Client) as part or all of the services it has been appointed by the Client to carry out. It is subject to the terms and conditions of that appointment.

SLR shall not be liable for the use of or reliance on any information, advice, recommendations and opinions in this document for any purpose by any person other than the Client. Reliance may be granted to a third party only in the event that SLR and the third party have executed a reliance agreement or collateral warranty.

Information reported herein may be based on the interpretation of public domain data collected by SLR, and/or information supplied by the Client and/or its other advisors and associates. These data have been accepted in good faith as being accurate and valid.

The copyright and intellectual property in all drawings, reports, specifications, bills of quantities, calculations and other information set out in this report remain vested in SLR unless the terms of appointment state otherwise.

This document may contain information of a specialised and/or highly technical nature and the Client is advised to seek clarification on any elements which may be unclear to it.

Information, advice, recommendations and opinions in this document should only be relied upon in the context of the whole document and any documents referenced explicitly herein and should then only be used within the context of the appointment.



Table of Contents

Basis of Report	i
Acronyms and Abbreviations	iii
Terminology	iii
26.0 Construction Plant Sound Levels	1
26.1 Introduction	1
26.2 Landfall Construction Plant.....	1
26.3 ECC Construction Plant.....	2
26.3.1 Stage 2 – Enabling Works	3
26.3.2 Stage 3 – Cable Infrastructure Installation	4
26.3.3 Stage 4 – Cable Installation.....	7
26.3.4 Stage 5 – Reinstatement Works and Demobilisation	8
26.4 OnSS Construction Plant.....	9

Tables in Text

Table 26.1: Landfall Construction Plant.....	1
Table 26.2 ECC Construction Phase Combined Sound Power Levels	2
Table 26.3: Plant Utilised in Topsoil Stripping and Site Prep	3
Table 26.4: Plant Utilised in Pre-Construction Drainage Installation	3
Table 26.5: Plant Utilised in Haul Road Installation	4
Table 26.6: Plant Utilised in ECC Minor Trenchless Drills	4
Table 26.7: Plant Utilised in ECC Major Trenchless Drills	5
Table 26.8: Plant Utilised in Trench Works.....	6
Table 26.9: Plant Utilised in Trench Backfilling.....	6
Table 26.10: Plant Utilised in Joint Bays Excavation and Backfill	7
Table 26.11: Plant Utilised in Cable Pulling.....	7
Table 26.12: Plant Utilised in Post Construction Drainage Installation.....	8
Table 26.13: Plant Utilised in Haul Road Removal	8
Table 26.14: Plant Utilised in Topsoil Reinstatement.....	9
Table 26.15: OnSS Construction Phase Combined Sound Power Levels	9
Table 26.16: Plant Utilised in OnSS Construction Phase – Groundworks.....	10
Table 26.17: Plant Utilised in OnSS Construction Phase – Building foundation works.	10
Table 26.18: Plant Utilised in OnSS Construction Phase – Access road and car parking works road works.....	11
Table 26.19: Plant Utilised in OnSS Construction Phase – Building Fabrication and Plant Installation	11



Acronyms and Abbreviations

Acronym	Expanded name
dB	Decibel
DCO	Development Consent Order
ECC	Export cable corridor
EIA	Environmental Impact Assessment
ES	Environmental Statement

Terminology

Term	Definition
The Applicant	GT R4 Ltd. The Applicant making the application for a DCO. The Applicant is GT R4 Limited (a joint venture between Corio Generation, Tota Energies and Gulf Energy Development (GULF)), trading as Outer Dowsing Offshore Wind. The Project is being developed by Corio Generation (a wholly owned Green Investment Group portfolio company), TotalEnergies and GULF.
Environmental Statement (ES)	The suite of documents that detail the processes and results of the EIA.
Export Cables	High voltage cables which transmit power from the Offshore Substations (OSS) to the Onshore Substation (OnSS) via an Offshore Reactive Compensation Platform (ORCP) if required, which may include one or more auxiliary cables (normally fibre optic cables).
Haul Road	The track within the onshore ECC which the construction traffic would use to facilitate construction.
Joint Bays	An excavation formed with a buried concrete slab at sufficient depth to enable the jointing of high voltage power cables.
Landfall	The location at the land-sea interface where the offshore export cables and fibre optic cables will come ashore.
The Project	Outer Dowsing Offshore Wind, an offshore wind generating station together with associated onshore and offshore infrastructure.



26.0 Construction Plant Sound Levels

26.1 Introduction

1. Presented below are the indicative sound power levels for the construction plant required in each construction phase of the Project, the indicative number required and the estimated percentage the plant will be operating during the activity.
2. The majority of the sound power levels were determined using the A-weighted sound pressure level (dB) at 10 m from Table C of BS 5228-1:2009+A1:2014; however other data sources were utilised as outlined within the tables and/or text.
3. For the landfall a construction layout was agreed with the Applicant, so the sources have been considered individually as shown in Table 26.1: .
4. For the onshore Export Cable Corridor (ECC) and Onshore Substation (OnSS) the combined sound power level of the all the plant was calculated, accounting for on-times.

26.2 Landfall Construction Plant

Table 26.1: Landfall Construction Plant

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity or Movements in hour	Resultant Sound Power Level, dB(A)	Maximum Noise Level, dB
Generator*	102	1	100	102	102
Telehandler*	107	1	75	106	117
Silent Piling Rig**	97	2	10	87 (per rig)	97
Directional Drill Generator****	105	2	100	105 (per generator)	105
Excavator (25 tonne)*	105	1	10 movements in an hour	-	116
Small Dump Truck*	104	1	10 movements in an hour	-	117
Mud Pump****	108	2	100	108 (per pump)	108
Mixing Tank****	103	1	100	103	103
Shaker System***	98	1	100	98	98



Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity or Movements in hour	Resultant Sound Power Level, dB(A)	Maximum Noise Level, dB
Cuttings / Recycling Tank****	108	1	100	108	108
<p>*noise level sourced from BS5228. **noise level sourced from document 'Noise and Vibration Monitoring for Silent Piling in Singapore' (Chun Fai Leung and Teik Lim GOH). ***noise level sourced from Triton Knoll landfill plant. ****noise level sources from Awel Y Mor Horizontal Directional Drilling plant.</p>					

26.3 ECC Construction Plant

- A summary of the ECC construction activities associated per stage and their total combined sound power levels is given in Table 26.2 below.

Table 26.2 ECC Construction Phase Combined Sound Power Levels

Stage	Activity	Combined Sound Power Level, dB(A)
1 – Pre-construction works	Pre-construction works consists of environmental works that are non-intrusive i.e. without the use of construction plant	N/A
2 – Enabling Works	Topsoil Stripping and Site Prep	114
	Pre-Construction Drainage	111
	Haul Road Installation	114
3 – Cable Infrastructure Installation	Trenchless Drilling – Minor Drill	114
	Trenchless Drilling – Major Drill	116
	Trench Works	112
	Trench Backfilling	111
4 – Cable Installation	Joint Bays Excavation and Backfill	111
	Cable Pulling	108
5 – Reinstatement Works and Demobilisation	Post Construction Drainage Installation	111
	Haul Road Removal	115
	Topsoil Reinstatement	112

- The plant lists used to calculate the combined sound power levels shown in Table 26.2 are shown in Table 26.3 to Table 26.14.



26.3.1 Stage 2 – Enabling Works

Table 26.3: Plant Utilised in Topsoil Stripping and Site Prep

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
30 Tonne Excavators	103	3	80	107	Table C.2 item 16 from BS 5228-1
20 Tonne Dozer	109	2	80	111	Table C.2 item 12 from BS 5228-1
BMA40 dump truck	109	1	80	108	Table C.4 item 1 from BS 5228-1
Refuelling – tractor and double skinned trailer	107	1	20	100	Table C.4 item 75 from BS 5228-1
Logarithmic sum				114	

Table 26.4: Plant Utilised in Pre-Construction Drainage Installation

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
13 Tonne Excavator	97	3	80	101	Table C.2 item 25 from BS 5228-1
Hopper truck – Stone cart – CT12	108	1	80	107	Table C.2 item 34 from BS 5228-1
Mastenbroek trencher	105	1	80	104	Table D.3 item 106 from BS 5228-1
Stone delivery	113	1	20	106	Table D.3 item 112 from BS 5228-1
Fuel delivery	107	1	20	100	Table C.4 item 75 from BS 5228-1
Logarithmic sum				111	



Table 26.5: Plant Utilised in Haul Road Installation

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
Tonne Excavator – 13t	97	3	80	101	Table C.2 item 25 from BS 5228-1
20t dozer	109	1	80	108	Table C.2 item 12 from BS 5228-1
Vibrating Roller – driven	106	1	80	105	Table D.3 item 116 from BS 5228-1
Vibrating Roller - ramex	106	1	80	105	Table D.3 item 116 from BS 5228-1
Dump truck – 10t	104	2	80	106	Table C.4 item 4 from BS 5228-1
Stone delivery	113	1	20	106	Table D3 item 112 1 per hour for stone delivery to stockpile
Plant refuelling	107	1	20	100	Table C.4 item 75 from BS 5228-1
Welfare unit (Garric)		1		N/A	
Logarithmic sum				114	

26.3.2 Stage 3 – Cable Infrastructure Installation

Table 26.6: Plant Utilised in ECC Minor Trenchless Drills

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
Generator	102	1	100	102	Table C.4 item 84 from BS 5228-1
Telehandler	107	1	20	101	Table C.4 item 54 from BS 5228-1
Drilling Rig	111	1	100	111	Table C3 item 14, from BS 5228-1
Excavator	99	1	100	99	Table C.2 item 21 from BS 5228-1
Small dump truck/bowser/mud return	104	1	100	104	Table C4 item 4, from BS 5228-1
Mud Pump	108	1	100	108	Awel Y Mor ES construction plant
Mixing Tank	103	1	100	103	
Logarithmic sum				114	



Table 26.7: Plant Utilised in ECC Major Trenchless Drills

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
Generator	102	1	100	102	Table C.4 item 84 from BS 5228-1
Telehandler	107	1	75	106	Table C.4 item 54 from BS 5228-1
Drilling Rig	111	1	100	111	Provided by the Applicant
Excavator Mounted Vibrator for Sheet Piles	107	1	100	107	Equipment Data Sheet (including Certificate showing Declaration of Conformity)
Excavator (20t)	99	1	100	99	Table C.2 item 21 from BS 5228-1
Small dump truck/bowser/mud return	104	1	100	104	Table C4 item 4, from BS 5228-1
Mud Pump	108	1	100	108	Awel Y Mor ES construction plant
Mixing Tank	103	1	100	103	
Shaker System	98	1	100	98	Triton Knoll ES construction plant
Cuttings/recycling tanks	108	1	100	108	
Logarithmic sum				116	



Table 26.8: Plant Utilised in Trench Works

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
30 Tonne Excavators	103	2	80	105	Table C.2 item 16 from BS 5228-1
Hopper truck	108	1	80	107	Table C.2 item 34 from BS 5228-1
Vibratory Roller	106	1	80	105	Table D.3 item 116 from BS 5228-1
Thermal sand delivery tractor and trailer	107	1	20	100	Table C.4 item 75 from BS 5228-1
Tractor and trailer for duct installation	107	1	20	100	Table C.4 item 75 from BS 5228-1
Dewatering plant and gen set	102	1	100	102	Table C.4 item 84 from BS 5228-1 (generator)
	96	1	100	96	Table C.4 item 88 from BS 5228-1 (water pump)
Refuelling	107	1	20	100	Table C.4 item 75 from BS 5228-1
Logarithmic sum				112	

Table 26.9: Plant Utilised in Trench Backfilling

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
30 Tonne Excavators	103	2	80	105	Table C.2 item 16 from BS 5228-1
Vibratory Roller	106	2	80	108	Table D.3 item 116 from BS 5228-1
Dewatering plant and gen set	102	1	100	102	Table C.4 item 84 from BS 5228-1 (generator)
	96	1	100	96	Table C.4 item 88 from BS 5228-1 (water pump)
Refuelling	107	1	20	100	Table C.4 item 75 from BS 5228-1
Logarithmic sum				111	



26.3.3 Stage 4 – Cable Installation

Table 26.10: Plant Utilised in Joint Bays Excavation and Backfill

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
30 Tonne Excavators	103	1	80	102	Table C.2 item 16 from BS 5228-1
Vibratory Roller	106	2	80	108	Table D.3 item 116 from BS 5228-1
Concrete delivery	106	1	50	103	Table C.4 item 32 from BS 5228-1
Dewatering plant and gen set	102	1	100	102	Table C.4 item 84 from BS 5228-1 (generator)
	96	1	100	96	Table C.4 item 88 from BS 5228-1 (water pump)
Refuelling	107	1	20	100	Table C.4 item 75 from BS 5228-1
Logarithmic sum				111	

Table 26.11: Plant Utilised in Cable Pulling

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
Diesel Powered Winch Unit	105	1	100	105	Table C.10 Item 20 from BS 5228-1
Generator	102	1	100	102	Table C.4 item 84 from BS 5228-1
Cable Delivery	110	1	20	103	Table C6 item 23 from BS 5228-1
Logarithmic sum				108	



26.3.4 Stage 5 – Reinstatement Works and Demobilisation

Table 26.12: Plant Utilised in Post Construction Drainage Installation

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
13 Tonne Excavator	97	3	80	101	Table C.2 item 25 from BS 5228-1
Hopper truck – Stone cart – CT12	108	1	80	107	Table C.2 item 34 from BS 5228-1
Mastenbroek trencher	105	1	80	104	Table D.3 item 106 from BS 5228-1
Stone delivery	113	1	20	106	Table D3 item 112 from BS 5228-1
Fuel delivery	107	1	20	100	Table C.4 item 75 from BS 5228-1
Logarithmic sum				111	

Table 26.13: Plant Utilised in Haul Road Removal

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
Tonne Excavator – 13t	97	3	80	101	Table C.2 item 25 from BS 5228-1
20t dozer	109	2	80	111	Table C.2 item 12 from BS 5228-1
Raker/stone picker	107	1	80	106	Table C.4 item 75 from BS 5228-1
Dump truck – BMa40	109	2	80	111	Table C.4 item 1 from BS 5228-1
Stone removal	107	1	20	100	Table C.4 item 75 from BS 5228-1
Plant refuelling	107	1	20	100	Table C.4 item 75 from BS 5228-1
Welfare unit (Garric)		1		N/A	
Logarithmic sum				115	



Table 26.14: Plant Utilised in Topsoil Reinstatement

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)	Data Source
30 Tonne Excavators	103	3	80	107	Table C.2 item 16 from BS 5228-1
Rakers/rotavator machines	107	2	80	109	Table C.4 item 75 from BS 5228-1
Dewatering	102	1	100	102	Table C.4 item 84 from BS 5228-1 (generator)
	96	1	100	96	Table C.4 item 88 from BS 5228-1 (water pump)
Plant refuelling	107	1	20	100	Table C.4 item 75 from BS 5228-1
Logarithmic sum				112	

26.4 OnSS Construction Plant

- A summary of the OnSS construction activities and their total combined sound power levels is given in Table 26.15 below.

Table 26.15: OnSS Construction Phase Combined Sound Power Levels

Activity	Combined Sound Power Level, dB(A)
Ground Works	123
Building Foundation	119
Access Road and Carparks	116
Building Fabric and High Voltage Plant	118

- The plant lists used to calculate the combined sound power levels shown in Table are shown in Table 26.16 to Table 26.19.
- The OnSS construction plant sound power levels have been referenced from another similar project which was consented in September 2023 by the Secretary of State, namely the Awel Y Mor offshore windfarm.



Table 26.16: Plant Utilised in OnSS Construction Phase – Groundworks

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)
Excavator (earthworks)	102	6	100	110
Excavator (hydraulic breaker)	113	4	100	119
Dozer	107	4	75	112
Air compressor	100	4	100	106
Dump truck	105	8	70	112
Generator	100	2	100	103
Crusher	116	2	80	118
Logarithmic sum				123

Table 26.17: Plant Utilised in OnSS Construction Phase – Building foundation works.

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)
Percussive piling rig	116	1	100	116
Tracked drilling rig with hydraulic drifter	82	1	100	82
Crane mounted auger	79	1	100	79
Mini piling rig	76	2	100	79
Compressor for mini piling	75	1	100	75
Dump truck	105	4	50	108
Truck mixer with pump	103	2	10	96
Excavator (earthworks)	102	3	80	106
Grinder	108	5	50	112
Compressor	100	2	100	103
Generator	100	2	100	103
Logarithmic sum				119



Table 26.18: Plant Utilised in OnSS Construction Phase – Access road and car parking works road works

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)
Excavator	102	2	100	105
Dump truck	105	4	70	109
Asphalt spreader with support lorry	106	1	100	106
Vibratory roller	106	2	70	107
Grader	112	1	100	112
Logarithmic sum				116

Table 26.19: Plant Utilised in OnSS Construction Phase – Building Fabrication and Plant Installation

Vehicle / Equipment	Sound Power Level, dB(A)	Indicative Number	Estimated Percentage of Operation During Activity	Resultant Sound Power Level, dB(A)
Mobile crane	102	1	50	99
Lorry	103	3	25	102
MEWP	78	2	75	80
Dump truck	105	4	10	101
Compressor	100	1	100	100
Forklift truck	105	2	50	105
Grinder	108	5	50	112
Pneumatic chipper/drill	114	3	50	116
Scaffolding	100	1	25	94
Logarithmic sum				118



