East Anglia TWO Offshore Windfarm

Appendix 25.4

Noise and Vibration Cumulative Impact Assessment with the Proposed East Anglia ONE North Project

Preliminary Environmental Information
Volume 3
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Glossary of Acronyms

AAWT	Annual Average Weekday Traffic
BNL	Basic Noise Level
BS	British Standard
CIA	Cumulative Impact Assessment
DCO	Development Consent Order
ES	Environmental Statement
HDD	Horizontal Directional Drilling
MW	Megawatt
NSR	Noise Sensitive Receptor
PEIR	Preliminary Environmental Information Report

Glossary of Terminology

Applicant	East Anglia TWO Limited.
Construction consolidation sites	Compounds which will contain laydown, storage and work areas for onshore construction works. The HDD construction compound will also be referred to as a construction consolidation site.
dB(A)	Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise level in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A).
dB(Z) (or previously Lleq)	Decibels measured on a sound level meter incorporating a flat frequency weighting (Z weighting) across the frequency range.
Decibel (dB)	A unit of noise level derived from the logarithm of the ratio between the value of a quantity and a reference value. It is used to describe the level of many different quantities. For sound pressure level the reference quantity is 20 µPa, the threshold of normal hearing is 0dB, and 140dB is the threshold of pain. A change of 1dB is only perceptible under controlled conditions. Under normal conditions a change in noise level of 3dB(A) is the smallest perceptible change.
Development area	The area comprising the Proposed onshore development Area and the Offshore Development Area
East Anglia TWO project	The proposed project consisting of up to 75 wind turbines, up to four offshore electrical platforms, up to one offshore operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
Evidence Plan Process	A voluntary consultation process with specialist stakeholders to agree the approach to the EIA and the information required to support HRA.

Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
Jointing bay	Underground structures constructed at regular intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
$L_{A10, T}$	The A weighted noise level exceeded for 10% of the specified measurement period (T). LA10 is the index generally adopted to assess traffic noise.
$L_{A90, T}$	The A weighted noise level exceeded for 90% of the specified measurement period (T). In BS 4142: 2014 it is used to define the 'background' noise level.
$L_{Aeq, T}$	The equivalent continuous sound level – the sound level of a notionally steady sound having the same energy as a fluctuating sound over a specified measurement period (T). LAeq, T is used to describe many types of noise and can be measured directly with an integrating sound level meter.
L_{Amax}	The maximum A-weighted sound pressure level recorded during a measurement.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Mitigation areas	Areas captured within the Development Area specifically for mitigating expected or anticipated impacts.
National Grid infrastructure	A National Grid substation, connection to the existing electricity pylons and National Grid overhead line realignment works which will be consented as part of the proposed East Anglia TWO project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines to transport electricity from the National Grid substation to the national electricity grid
National Grid overhead line realignment works area	The proposed area for National Grid overhead line realignment works.
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia TWO project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia TWO project Development Consent Order.

National Grid substation location	The proposed location of the National Grid substation.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
Onshore cable corridor	The corridor within which the onshore cable route will be located.
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables and two fibre optic cables.
Proposed onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia TWO project from landfall to the connection to the national electricity grid.
Onshore substation	The East Anglia TWO substation and all of the electrical equipment within it.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia TWO project.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

25.4 Noise and Vibration Cumulative Impact Assessment with the proposed East Anglia ONE North Project

25.1 Introduction

1. This appendix covers the cumulative impact assessment of the proposed East Anglia TWO project with the proposed East Anglia ONE North project in relation to noise and vibration.

2. The East Anglia ONE North offshore windfarm project (the proposed East Anglia ONE North project) is also in the pre-application stage. The proposed East Anglia ONE North project will have a separate Development Consent Order (DCO) application but is working to the same programme of submission as the proposed East Anglia TWO project. The two projects will share the same landfall location and cable route and the two onshore substations will be co-located, and feed into the same National Grid substation.

3. The noise and vibration proposed East Anglia TWO project Cumulative Impact Assessment (CIA) will therefore initially consider the cumulative impact with only the East Anglia ONE North project against two different construction scenarios (i.e. construction of the two projects simultaneously and sequentially). The realistic worst case scenario of each impact is then carried through to the main body of the CIA assessment which considers other developments which are in close proximity to the proposed East Anglia TWO project.

4. For a more detailed description of the CIA please refer to ***Chapter 5 EIA Methodology***.

25.2 Construction Scenarios Realistic Worst Case

5. This appendix considers the proposed East Anglia TWO project and the proposed East Anglia ONE North project under two construction scenarios:

   - Scenario 1 - the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously; and
   - Scenario 2 - the proposed East Anglia TWO project and the proposed East Anglia ONE North project are built sequentially.

6. As discussed in ***section 25.1***, the realistic worst case (based on the assessment of these two construction scenarios) for each impact is then carried through to the wider CIA which considers other developments, projects or plans which have been screened into the CIA assessment for the proposed East Anglia TWO project.

7. It should be noted that the operational phase impacts on noise and vibration will be the same irrespective of the construction scenario. Therefore, operational impacts identified in Scenario 1 will be the same as those for Scenario 2.

8. Mitigation measures for the proposed East Anglia TWO project and proposed East Anglia ONE North project will be the same. These are detailed in ***Chapter 25 Noise and Vibration***

25.2.1 Scenario 1

9. ***Table A25.1*** presents the realistic worst case parameters of Scenario 1. In this instance, the proposed East Anglia TWO project and proposed East Anglia ONE North project are built simultaneously.

Table A25.1 Realistic Worst Case for Scenario 1

Impact	Parameter	Notes
Construction		
Impacts related to the landfall	HDD temporary works area: 13,300m^2 (70m x 190m) Transition bay excavation footprint (for 4 transition bays): 3,108m^2 (37m x 42m) Landfall CCS: 40,950m^2 (210m x 195m) Landfall transition bays approximate quantity of spoil material (for 4 transition bays): 908m^3	Landfall to be achieved via HDD. No beach access required. For the assessment, the worst case phase for construction noise is considered to be represented by months 1 to 24 (in line with the assessment presented in ***Chapter 26 Traffic and Transport***). This is therefore presented in the assessment within this chapter.
Impacts related to the onshore cable corridor	Onshore cable route: 574,720m^2 (8,980m x 64m) Jointing bay construction excavation footprint: 570m^2 (30.6m x 18.6m). Total for 72 jointing bays: 41,040m^2 (570m^2 x 36) HDD (retained as an option to cross SPA / SSSI): • Entrance pit CCS (x1): 13,650m^2 (195m x 70m) • Exit pit CCS (x1): 5,850m^2 (195m x 30m)	Onshore cable corridor construction footprint may be located anywhere within the proposed onshore development area. The location strategy for access routes, CCS and jointing bays will be to site them near to field boundaries or roads as far as practical. Two link boxes sit underground beside each jointing bay at a depth of approximately 1.2m.

Impact	Parameter	Notes
	Onshore cable route CCS: 40,950m^2 (210m x 195m). Total for 5 CCS: 204,750m^2 (40,950m^2 x 5) Temporary roads: • Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m^2 • Onshore cable route and substation access haul road (9m width): 18,675m^2 • Temporary access road: 23,495m^2 Onshore cable trench approximate quantity of spoil material: 26,642m^3	The construction footprint of these is included in the jointing bay construction excavation footprint. For the assessment, the worst case phase for construction noise is considered to be represented by months 1 to 24 (in line with the assessment presented in ***Chapter 26 Traffic and Transport***).. This is therefore presented in the assessment within this chapter
Impacts related to the onshore substation(s)	Onshore substation CCS: 17,100m^2 (190m x 90m). Total for 3 CCS: 51,300m^2 Permanent footprint (used as CCS during construction): 36,100m^2 (190m x 190m). Total for 2: 72,200m^2 Substation operational access road: 12,800m^2 (1,600m x 8m)	Construction access is included above as the onshore cable route and substation access haul road. For the assessment, the worst case phase for construction noise is considered to be represented by months 1 to 24 (in line with the assessment presented in ***Chapter 26 Traffic and Transport***). This is therefore presented in the assessment within this chapter
Impacts related to the National Grid Infrastructure	National Grid substation CCS: 78,750m^2 (250m x 315m) Permanent footprint (used as CCS during construction): 45,500m^2 (325m x 140m)	Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in ***Figure 6.6*** of ***Chapter 6 Project Description***. Construction access is included above as the onshore cable route and substation access haul road. Operational access is included above as the substation operational access road. For the assessment, the worst case phase for construction noise is considered to be represented by

Impact	Parameter	Notes
		months 1 to 24 (in line with the assessment presented in ***Chapter 26 Traffic and Transport***). This is therefore presented in the assessment within this chapter
Operation		
Impacts related to the landfall	4 transition bays will be installed underground, each with an operational volume of 227m^3	Transition bays will be buried approximately 1.2m underground – there will no above ground infrastructure.
Impacts related to the onshore cable corridor	72 jointing bays will be installed underground, each with an operational volume of 77m^{3}144 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m^3	Jointing bays will be buried approximately 1.2m underground – there will no above ground infrastructure. Link boxes will be located underground immediately adjacent to jointing bays – there will be no above ground infrastructure.
Impacts related to the onshore substation(s)	Operational footprint: 36,100m^2 (190m x 190m). Total for 2: 72,200m^2 Substation operational access road: 12,800m^2 (1,600m x 8m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR).
Impacts related to the National Grid Infrastructure	National Grid operational substation: 45,500m^2 (325m x 140m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR). Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in ***Figure 6.6*** of ***Chapter 6 Project Description***.
Decommissioning		

Impact	Parameter	Notes
No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ*. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.		

25.2.2 Scenario 2

10. Scenario 2 represents the realistic worst case scenario in the eventuality that the proposed East Anglia TWO project and proposed East Anglia ONE North project are built with a construction gap.

11. Scenario 2 assumes that when permission is granted, the proposed East Anglia TWO project will be constructed as soon as permission is granted. The proposed East Anglia ONE North project will leave the largest possible gap (between the reinstatement of the proposed East Anglia TWO project and start of construction for the proposed East Anglia ONE North project) to begin construction within the consent period. Further detail regarding the likely construction gap is provided in ***Chapter 5 EIA Methodology***.

Table A25.2 Realistic Worst Case for Scenario 2

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Construction			
Impacts related to the landfall	HDD temporary works area: 7,000m^2 (70m x 100m) Transition bay excavation footprint (for 2 transition bays): 1,554m^2 (37m x 42m) Landfall CCS: 18,400m^2 (160m x 115m) Landfall transition bays approximate quantity of spoil material (for 2 transition bays): 454m^3	HDD temporary works area: 7,000m^2 (70m x 100m) Transition bay excavation footprint (for 2 transition bays): 1,554m^2 (37m x 42m) Landfall CCS: 18,400m^2 (160m x 115m) Landfall transition bays approximate quantity of spoil material (for 2 transition bays): 454m^3	Landfall to be achieved via HDD. No beach access required.

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Impacts related to the onshore cable corridor	Onshore cable route: 287,360m^2 (8,980m x 32m) Jointing bay construction excavation footprint: 570m^2 (30.6m x 18.6m). Total for 36 jointing bays: 20,520m^2 (570m^2 x 36) HDD (retained as an option to cross SPA / SSSI): • Entrance pit CCS (x1): 7,000m^2 (100m x 70m) • Exit pit CCS (x1): 3,000m^2 (100m x 30m) Onshore cable route CCS: 18,400m^2 (160m x 115m). Total for 5 CCS: 92,000m^2 (18,400m^2 x 5) Temporary roads: • Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m^2 • Onshore cable route and substation access haul road (9m width): 18,675m^2 • Temporary access road: 23,495m^2 Onshore cable trench approximate quantity of spoil material: 13,321m^3	Onshore cable route: 287,360m^2 (8,980m x 32m) Jointing bay construction excavation footprint: 570m^2 (30.6m x 18.6m). Total for 36 jointing bays: 20,520m^2 (570m^2 x 36) HDD (retained as an option to cross SPA / SSSI): • Entrance pit CCS (x1): 7,000m^2 (100m x 70m) • Exit pit CCS (x1): 3,000m^2 (100m x 30m) Onshore cable route CCS: 18,400m^2 (160m x 115m). Total for 5 CCS: 92,000m^2 (18,400m^2 x 5) Temporary roads: • Onshore cable route haul road between landfall and Snape Road (4.5m wide with additional 4m for passing places at approximately 87m intervals): 41,376m^2 • Onshore cable route and substation access haul road (9m width): 18,675m^2 • Temporary access road: 23,495m^2 Onshore cable trench approximate quantity of spoil material: 13,321m^3	Onshore cable corridor construction footprint may be located anywhere within the proposed onshore development area. The location strategy for access routes, CCS and jointing bays will be to site them near to field boundaries or roads as far as practical. Two link boxes sit underground beside each jointing bay at a depth of approximately 1.2m. The construction footprint of these is included in the jointing bay construction excavation footprint.
Impacts related to the onshore substation	Onshore substation CCS: 17,100m^2 (190m x 90m) Permanent footprint (used as CCS during construction): 36,100m^2 (190m x 190m) Substation operational access road: 12,800m^2 (1,600m x 8m)	Onshore substation CCS: 17,100m^2 (190m x 90m) Permanent footprint (used as CCS during construction): 36,100m^2 (190m x 190m) Substation operational access road: 12,800m^2 (1,600m x 8m)	Construction access is included above as the onshore cable route and substation access haul road.

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Impacts related to the National Grid Infrastructure	National Grid substation CCS: 78,750m^2 (250m x 315m) Permanent footprint (used as CCS during construction): 45,500m^2 (325m x 140m)	National Grid substation CCS: 78,750m^2 (250m x 315m) Permanent footprint (used as CCS during construction): 45,500m^2 (325m x 140m)	Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in ***Figure 6.6*** of ***Chapter 6 Project Description***. Construction access is included above as the onshore cable route and substation access haul road. Operational access is included above as the substation operational access road,
Operation			
Impacts related to the landfall	2 transition bays will be installed underground, each with an operational volume of 227m^3	2 transition bays will be installed underground, each with an operational volume of 227m^3	Transition bays will be buried approximately 1.2m underground – there will no above ground infrastructure.
Impacts related to the onshore cable corridor	36 jointing bays will be installed underground, each	36 jointing bays will be installed underground, each	Jointing bays will be buried approximately 1.2m underground –

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
	with an operational volume of 77m^3 72 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m^3	with an operational volume of 77m^3 72 link boxes will be installed underground (2 per jointing bay), each with an operational volume of 3m^3	there will no above ground infrastructure. Link boxes will be located underground immediately adjacent to jointing bays – there will be no above ground infrastructure.
Impacts related to the onshore substation	Operational footprint: 36,100m^2 (190m x 190m) Substation operational access road: 12,800m^2 (1,600m x 8m)	Operational footprint: 36,100m^2 (190m x 190m) Substation operational access road: 12,800m^2 (1,600m x 8m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR).
Impacts related to the National Grid Infrastructure	National Grid operational substation: 45,500m^2 (325m x 140m)	National Grid operational substation: 45,500m^2 (325m x 140m)	The operational footprint does not include the additional landscaping footprint (which will be agreed post-PEIR). Design for the required overhead line (OHL) realignment work (including cable sealing end CCSs and pylon realignment CCS) is currently on going. As more detail is made available, this will be fully assessed and included in the Environmental Statement (ES) and DCO application. However, indicative locations for cable sealing end CCSs and pylon realignment CCS are shown in ***Figure 6.6*** of ***Chapter 6 Project Description***.

Impact	Proposed East Anglia TWO Project Parameters	Proposed East Anglia ONE North Project Parameters (on the assumption that the proposed East Anglia TWO project is post-construction)	Notes
Decommissioning			
No decision has been made regarding the final decommissioning policy for the onshore infrastructure as it is recognised that industry best practice, rules and legislation change over time. However, the onshore substation will likely be removed and be reused or recycled. It is expected that the onshore cables will be removed and recycled, with the transition bays and cable ducts (where used) left *in situ*. The detail and scope of the decommissioning works will be determined by the relevant legislation and guidance at the time of decommissioning and agreed with the regulator. A decommissioning plan will be provided. As such, for the purposes of a worst-case scenario, impacts no greater than those identified for the construction phase are expected for the decommissioning phase.			

25.3 Cumulative Impact Assessment during Construction

12. The construction phase assessment methodology and assumptions as detailed in ***section 25.4.3.1*** of ***Chapter 25 Noise and Vibration*** are applicable under Scenario 2. Impact magnitudes detailed in ***Table 25.10*** to ***Table 25.12*** of ***Chapter 25 Noise and Vibration*** along with the Impact significance matrix (***Table 25.22*** of ***Chapter 25 Noise and Vibration***) are also relevant to this CIA. Details of the plant associated with the construction of the proposed East Anglia TWO project in isolation are also valid for the construction of the proposed East Anglia ONE North project. This is shown in ***Table A25.3*** below for ease.

Table A25.3 Construction Plant - Proposed East Anglia TWO Project

Location	Name	No.	Source type	BS5228 Reference	LAeq (dB) at 10m	On time correction (%)
Landfall and Cable Route	D6 Dozer	3	Point	C2.11	84.0	85
	30T Excavator	2	Point	C2.16	79.4	85
	20T Dumper	2	Point	C2.30	86.8	85
	Smooth Drum vibro road roller	2	Point	C5.20	90.8	85
	21T excavator	2	Point	C2.3	86.0	85
	5T Forward Tipping Dumper	2	Point	C4.7	91.6	85
	Loading shovel	1	Point	C10.4	91.5	85
	Tractor & fencing kit	1	Point	C4.74	84.2	85

Location	Name	No.	Source type	BS5228 Reference	LAeq (dB) at 10m	On time correction (%)
	Tractor & trailer	1	Point	C4.75	94.0	85
	Tractor & Fuel bowser (or self-propelled)	1	Point	C6.38	89.6	85
	Tractor & Water bowser (for dust suppression)	1	Point	C6.38	89.6	85
	Grader	1	Point	C6.31	92.4	85
	Telehandler	1	Point	C2.35	86.2	85
	Mobile self-contained welfare unit	1	Point	N/A SoundPLAN Library	LwA 68.2	85
	Mobile generator	1	Point	C4.76	81.0	85
	Temporary lighting	1	Point	C4.76	81.0	85
	Road surface paver & roller	1	Point	C5.30	82.2	85
	Skip Wagon Movements	Various based on Section and phase	Line	C8.21	87.2	Split evenly over 12 hour day (7 – 19hrs)
	HDD Drill		Point	N/A	LwA 105	100 (24hrs/7 days)
	Mud Pump		Point	N/A	LwA 93	100 (24hrs/7 days)
	Power Supply		Point	N/A	LwA 105	100 (24hrs/7 days)
	Tractor & Cable Drum Roller		Point	C4.74	84.2	85
	Tractor & Soil Tiller		Point	C4.74	84.2	85
	Cement Mixer		Point	C4.18	81.6	85
	Mobile Crane		Point	C4.41	77.4	85
	Crawler Crane		Point	C4.43	82.0	85
	Mobile generator		Point	C4.76	81.0	85
	Pump		Point	C2.45	75.0	85

Location	Name	No.	Source type	BS5228 Reference	LAeq (dB) at 10m	On time correction (%)
	Cable Laying Tracked Crane		Point	C4.50	75.5	85
	Pre-Cast Concrete Truck		Point	C4.20	84.9	85
	Mobile Concrete Pump		Point	C3.26	85.6	85
	Cable Winch		Point	C4.52	78.5	85
Substation As for Landfall and Cable Route plus the following additional plant	Concrete Batching Plant		Point	C4.22	81.7	85
	Dry Mix Silos		Point	C3.26	85.6	85
	JCB Wheeled Excavator		Point	C5.34	75.5	85
	3t Forward Tipping Dumper		Point	C4.9	86.5	85
	Scissor Lift		Point	C4.59	83.9	85
	Mobile Aerial Platform		Point	C4.57	80.4	85
	Mobile Crane		Point	C4.41	77.4	85
	Mobile Crane Heavy Use		Point	C4.50	75.5	85
	Specialist Gantry Crane		Point	C4.50	75.5	85
	Static Crane		Point	C4.48	85.5	85
	Forklift		Point	N/A	LwA 75.0	85
	Trench Roller		Point	C10.23	60.4	85

13. The following sections discuss which of the two construction scenarios detailed in ***section 25.2*** will be the realistic worst case in terms of impacts through noise and vibration.

25.3.1 Cumulative Impact 1: Increased Noise on Residential Receptors Along the Proposed Onshore Development Area

25.3.1.1 Scenario 1

14. Based on ***Chapter 6 Project Description***, an indicative list of construction equipment under Scenario 1 has been developed and are the same as the plant detailed in ***Table A25.3***.

15. As a worst-case scenario, HDD has been assumed to be in operation at the landfall location for 24 hours a day and assessed accordingly; for all other

construction activities at the landfall, onshore cable route and onshore substation the assessment is based on construction between the hours of 07:00 to 19:00 Monday to Saturday.

16. ***Table A25.4*** presents the predicted daytime, evening and weekends, and night time noise level at the nearest residential receptors including embedded mitigation for the construction phase, as outlined in ***section 25.3.3*** of ***Chapter 25 Noise and Vibration***.

Table A25.4 Landfall Construction Noise Scenario 1 – Predicted Impacts Month 1 to 24

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Worst case Predicted Receptor Noise level dBA	Worst Case Impact Magnitude	Worst Case Impact Significance
LFR1	Daytime	A (65)	63.0	No Impact	Negligible
	Evening	A (55)	40.8	No Impact	Negligible
	Night	B (50)	41.1	No Impact	Negligible
LFR2	Daytime	A (65)	52.0	No Impact	Negligible
	Evening	A (55)	41.0	No Impact	Negligible
	Night	A (45)	41.2	No Impact	Negligible
LFR3	Daytime	A (65)	62.5	No Impact	Negligible
	Evening	A (55)	38.1	No Impact	Negligible
	Night	A (45)	38.2	No Impact	Negligible
LFR4	Daytime	A (65)	50.3	No Impact	Negligible
	Evening	A (55)	39.1	No Impact	Negligible
	Night	A (45)	39.6	No Impact	Negligible

17. The results show that predicted noise levels from construction works during Scenario 1 at the landfall location would be of no impact magnitude on receptors of medium sensitivity and therefore impacts would be of **negligible** significance. Therefore no additional mitigation is required.

18. ***Table A25.5*** presents the predicted noise level at the nearest residential receptors along the onshore cable route including embedded mitigation for the construction phase, as outlined in ***section 25.3.3*** of ***Chapter 25 Noise and Vibration***.

Table A25.5 Onshore Cable Route Construction Noise Scenario 1 – Predicted Impacts Month 1 to 24 Daytime

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Predicted Receptor Noise level Range dBA	Impact Magnitude	Impact Significance
CCR1	Daytime	A (65)	55.7 to 59.4	No Impact	Negligible
CCR2	Daytime	A (65)	54.8 to 62.5	No Impact	Negligible
CCR3	Daytime	A (65)	45.1 to 48.5	No Impact	Negligible
CCR4	Daytime	A (65)	44.3 to 49.5	No Impact	Negligible
CCR5	Daytime	A (65)	44.8 to 46.7	No Impact	Negligible
CCR6	Daytime	A (65)	43.0 to 45.2	No Impact	Negligible
CCR7	Daytime	A (65)	59.2 to 65.4	No Impact	Negligible
CCR8	Daytime	A (65)	49.0 to 53.7	No Impact	Negligible
CCR9	Daytime	A (65)	50.0 to 57.0	No Impact	Negligible
CCR10	Daytime	A (65)	48.7 to 63.0	No Impact	Negligible
CCR11	Daytime	A (65)	47.6 to 60.8	No Impact	Negligible
CCR12	Daytime	A (65)	48.2 to 51.9	No Impact	Negligible
CCR13	Daytime	A (65)	44.1 to 57.0	No Impact	Negligible
CCR14	Daytime	A (65)	51.3 to 54.6	No Impact	Negligible
CCR15	Daytime	A (65)	49.8 to 55.8	No Impact	Negligible
CCR16	Daytime	A (65)	50.6 to 54.5	No Impact	Negligible
CCR17	Daytime	A (65)	51.6 to 55.9	No Impact	Negligible
CCR18	Daytime	A (65)	49.0 to 42.5	No Impact	Negligible
CCR19	Daytime	A (65)	40.0 to 47.6	No Impact	Negligible

19. The results show that predicted noise levels from construction works during Scenario 1 at the cable route locations would be of no impact magnitude on receptors of medium sensitivity and therefore impacts would be of **negligible** significance. Therefore no additional mitigation is required.

20. ***Table A25.6*** presents the predicted noise level for the Saturday 1300 to 1400hrs period at the nearest residential receptors along the onshore cable route including embedded mitigation for the construction phase, as outlined in ***section 25.3.3*** of ***Chapter 25 Noise and Vibration***.

Table A25.6 Onshore Cable Route Construction Noise Scenario 1 – Predicted Impacts Month 1 to 24 Weekends

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Predicted Receptor Noise level Range dBA	Impact Magnitude Range	Impact Significance Range
CCR1	Saturday 13:00 to 19:00	A (55)	55.7 to 59.4	Negligible to Medium	Negligible to Moderate
CCR2		A (55)	54.8 to 62.5	No Impact to High	Negligible to Major
CCR3		A (55)	45.1 to 48.5	No Impact	Negligible
CCR4		A (55)	44.3 to 49.5	No Impact	Negligible
CCR5		A (55)	44.8 to 46.7	No Impact	Negligible
CCR6		A (55)	43.0 to 45.2	No Impact	Negligible
CCR7		A (55)	59.2 to 65.4	Medium to High Impact	Moderate to Major
CCR8		A (55)	49.0 to 53.7	No Impact	Negligible
CCR9		A (55)	50.0 to 57.0	No Impact to Low	Negligible to Minor
CCR10		A (55)	48.7 to 63.0	No Impact to High	Negligible to Major
CCR11		A (55)	47.6 to 60.8	No Impact to High	Negligible to Major
CCR12		A (55)	48.2 to 51.9	No Impact	Negligible
CCR13		A (55)	44.1 to 57.0	No Impact to Low	Negligible to Minor
CCR14		A (55)	51.3 to 54.6	No Impact	Negligible
CCR15		A (55)	49.8 to 55.8	No Impact to Negligible	Negligible to Minor
CCR16		A (55)	50.6 to 54.5	No Impact	Negligible
CCR17		A (55)	51.6 to 55.9	No Impact to Negligible	Negligible to Minor
CCR18		A (55)	49.0 to 42.5	No Impact	Negligible
CCR19		A (55)	40.0 to 47.6	No Impact	Negligible

21. The results show that predicted noise levels from construction works during the Saturday period 13:00 to 19:00hrs for the proposed East Anglia Scenario 1 TWO project at the onshore cable route noise sensitive receptors (NSR's) would be of

no to high impact magnitude on receptors of medium sensitivity and therefore impacts would range from **negligible** to **major** significance. Therefore additional mitigation is required during this assessed time period. Enhanced mitigation measures are detailed in ***section 25.6.1.2*** of ***Chapter 25 Noise and Vibration***.

22. The residual magnitude of effect after enhanced mitigation measures are applied will be negligible on a medium sensitive receptor. Using the significance matrix detailed in ***Table 25.22*** of ***Chapter 25 Noise and Vibration*** this represents a negligible impact.

23. ***Table A25.7*** presents the predicted daytime noise level at the nearest residential receptors at the onshore substations including embedded mitigation for the construction phase, as outlined in ***section 25.3.3*** of ***Chapter 25 Noise and Vibration***.

Table A25.7 Onshore Substations Construction Noise Scenario 1 - Predicted Impacts Month 1 to 24 Daytime

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Predicted Receptor Noise level Range dBA	Impact Magnitude	Impact Significance
SSR1	Daytime	A (65)	47.5 to 52.2	No Impact	Negligible
SSR2	Daytime	A (65)	49.9 to 55.8	No Impact	Negligible
SSR3	Daytime	A (65)	46.5 to 51.5	No Impact	Negligible
SSR4	Daytime	A (65)	46.9 to 51.9	No Impact	Negligible
SSR5	Daytime	A (65)	50.5 to 56.0	No Impact	Negligible
SSR6	Daytime	A (65)	50.3 to 54.1	No Impact	Negligible
SSR7	Daytime	A (65)	46.5 to 50.9	No Impact	Negligible
SSR8	Daytime	A (65)	42.7 to 47.1	No Impact	Negligible
SSR9	Daytime	A (65)	44.9 to 49.8	No Impact	Negligible
SSR10	Daytime	A (65)	38.8 to 42.8	No Impact	Negligible
SSR11	Daytime	A (65)	41.7 to 45.9	No Impact	Negligible
SSR12	Daytime	A (65)	41.1 to 45.7	No Impact	Negligible
SSR13	Daytime	A (65)	42.9 to 46.2	No Impact	Negligible

24. The results show that predicted noise levels from construction works during under Scenario 1 at the onshore substation locations would be of no impact magnitude on receptors of medium sensitivity and therefore impacts would be of **negligible** significance.

25. ***Table A25.8*** presents the predicted noise level at the nearest residential receptors in proximity to the onshore substation including embedded mitigation for the weekend period during the construction phase, as outlined in ***section 25.3.3*** of ***Chapter 25 Noise and Vibration***.

Table A25.8 Onshore Substation Construction Noise Proposed Scenario 1 – Predicted Impacts Month 1 to 24 Weekends

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Predicted Receptor Noise level Range dBA	Impact Magnitude Range	Impact Significance Range
SSR1	Saturday 13:00 to 19:00	A (55)	47.5 to 52.2	No Impact	Negligible
SSR2		A (55)	49.9 to 55.8	No Impact to Negligible	Negligible to Minor
SSR3		A (55)	46.5 to 51.5	No Impact	Negligible
SSR4		A (55)	46.9 to 51.9	No Impact	Negligible
SSR5		A (55)	50.5 to 56.0	No Impact to Low	Negligible to Minor
SSR6		A (55)	50.3 to 54.1	No Impact	Negligible
SSR7		A (55)	46.5 to 50.9	No Impact	Negligible
SSR8		A (55)	42.7 to 47.1	No Impact	Negligible
SSR9		A (55)	44.9 to 49.8	No Impact	Negligible
SSR10		A (55)	38.8 to 42.8	No Impact	Negligible
SSR11		A (55)	41.7 to 45.9	No Impact	Negligible
SSR12		A (55)	41.1 to 45.7	No Impact	Negligible
SSR13		A (55)	42.9 to 46.2	No Impact	Negligible

26. The results show that predicted noise levels from construction works during the Saturday period 13:00 to 19:00hrs for the proposed under proposed East Anglia TWO Scenario 1 project at the substation locations would be of no impact magnitude at most receptors of medium sensitivity with the exception of SSR2 and SSR5. Therefore, impacts would be of minor significance at SSR2 and SSR5, with a **negligible** significance for all other receptors, and of minor significance at SSR2. Therefore, additional mitigation is required at receptors SSR2 and SSR5. Enhanced mitigation measures are detailed in ***section 25.6.1.2*** of ***Chapter 25 Noise and Vibration***.

27. The residual magnitude of effect after enhanced mitigation measures are applied will be negligible on a medium sensitive receptor. Using the significance matrix detailed in ***Table 25.22*** of ***Chapter 25 Noise and Vibration*** this represents a negligible impact.

25.3.1.2 Scenario 2

28. Under Scenario 2 each project is constructed as a standalone scheme, whereby any works are completed for East Anglia TWO (full reinstatement), and then East Anglia ONE North construction would follow at a later date. Therefore, the impact significance during construction of the proposed East Anglia TWO project alone (assessment in ***Table 25.26*** to ***Table 25.29*** of ***Chapter 25 Noise and Vibration***) will then be the same for construction of the proposed East Anglia ONE North project alone at the landfall and onshore cable route. Therefore, under Scenario 2, the cumulative impact with the proposed East Anglia ONE North project is as presented in the ***section 25.6.1.1*** of ***Chapter 25 Noise and Vibration*** under the assessment of the proposed East Anglia TWO project and will be of **negligible** significance.

29. However, as the proposed East Anglia TWO and proposed East Anglia ONE North projects have slightly different onshore substation locations, impacts on sensitive receptors during construction may differ due to their relative proximity to the construction works.

30. As the onshore substations will be constructed at separate times, under Scenario 2, the impact of constructing the proposed East Anglia TWO substation is as presented in ***section 25.6.1.1*** of ***Chapter 25 Noise and Vibration***. The impact of constructing the proposed East Anglia ONE North substation is presented below in ***Table A25.9***. This presents the predicted daytime noise level at the nearest residential receptors to the proposed East Anglia ONE North onshore substation including embedded mitigation for the construction phase, as outlined in ***section 25.3.3*** of ***Chapter 25 Noise and Vibration***.

Table A25.9 East Anglia ONE North Substation Construction Noise Scenario 2 – Predicted Impacts Month 1 to 24 Daytime

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Predicted Receptor Noise level Range dBA	Impact Magnitude	Impact Significance
SSR1	Daytime	A (65)	44.9 to 49.7	No Impact	Negligible
SSR2	Daytime	A (65)	48.8 to 53.1	No Impact	Negligible
SSR3	Daytime	A (65)	44.6 to 48.8	No Impact	Negligible
SSR4	Daytime	A (65)	46.2 to 50.5	No Impact	Negligible

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Predicted Receptor Noise level Range dBA	Impact Magnitude	Impact Significance
SSR5	Daytime	A (65)	49.8 to 55.6	No Impact	Negligible
SSR6	Daytime	A (65)	49.8 to 53.3	No Impact	Negligible
SSR7	Daytime	A (65)	44.4 to 48.5	No Impact	Negligible
SSR8	Daytime	A (65)	41.2 to 45.0	No Impact	Negligible
SSR9	Daytime	A (65)	43.4 to 47.6	No Impact	Negligible
SSR10	Daytime	A (65)	38.0 to 40.9	No Impact	Negligible
SSR11	Daytime	A (65)	40.8 to 44.1	No Impact	Negligible
SSR12	Daytime	A (65)	39.9 to 43.7	No Impact	Negligible
SSR13	Daytime	A (65)	41.9 to 44.3	No Impact	Negligible

31. The results show that predicted daytime noise levels from construction works during Scenario 2, from the construction of the proposed East Anglia ONE North substation, would be of no impact magnitude on receptors of medium sensitivity and therefore impacts would be of **negligible** significance. Therefore no additional mitigation is required.

32. Construction impacts under both Scenario 1 and Scenario 2 are considered to be of **negligible** significance. Therefore, there is no difference in impact between the two construction scenarios.

33. ***Table A25.10*** presents the predicted weekend (Saturday 13:00 to 19:00hrs) noise level at the nearest residential receptors to the proposed East Anglia ONE North onshore substation including embedded mitigation for the construction phase, as outlined in ***section 25.3.3*** of ***Chapter 25 Noise and Vibration***.

Table A25.10 East Anglia ONE North Substation Construction Noise Scenario 2 – Predicted Impacts Month 1 to 24 Weekends

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Predicted Receptor Noise level Range dBA	Impact Magnitude Range	Impact Significance Range
SSR1	Saturday 13:00 to 19:00	A (55)	44.9 to 49.7	No Impact	Negligible
SSR2		A (55)	48.8 to 53.1	No Impact	Negligible
SSR3		A (55)	44.6 to 48.8	No Impact	Negligible

Receptor Identifier	BS5228 Reference Period	BS5228 Derived Threshold Category dBA	Predicted Receptor Noise level Range dBA	Impact Magnitude Range	Impact Significance Range
SSR4		A (55)	46.2 to 50.5	No Impact	Negligible
SSR5		A (55)	49.8 to 55.6	No Impact to Negligible	Negligible to Minor
SSR6		A (55)	49.8 to 53.3	No Impact	Negligible
SSR7		A (55)	44.4 to 48.5	No Impact	Negligible
SSR8		A (55)	41.2 to 45.0	No Impact	Negligible
SSR9		A (55)	43.4 to 47.6	No Impact	Negligible
SSR10		A (55)	38.0 to 40.9	No Impact	Negligible
SSR11		A (55)	40.8 to 44.1	No Impact	Negligible
SSR12		A (55)	39.9 to 43.7	No Impact	Negligible
SSR13		A (55)	41.9 to 44.3	No Impact	Negligible

34. The results show that predicted daytime noise levels from construction works (Scenario 2) during the Saturday period 13:00 to 19:00hrs Scenario 2, from the construction of the proposed East Anglia ONE North substation, would be of no impact magnitude at most receptors of medium sensitivity with the exception of SSR2on receptors of medium sensitivity and. Therefore, impacts would be of minor significance at SSR2, and of negligible significance at all other receptors. Therefore additional mitigation is required at receptor SSR2. Enhanced mitigation measures are detailed in ***section 25.6.1.2*** of ***Chapter 25 Noise and Vibration***.

35. The residual magnitude of effect after enhanced mitigation measures are applied will be **negligible** on a medium sensitive receptor. Using the significance matrix detailed in ***Table 25.22*** of ***Chapter 25 Noise and Vibration*** this represents a **negligible** impact.

25.3.2 Cumulative Impact 2: Increased Noise on Residential Receptors from Off-Site Construction Traffic Noise

25.3.2.1 Scenario 1

36. ***Table A25.11*** shows the calculated change in traffic flow on the road links identified by the transport assessment as carrying construction traffic (see ***Chapter 26 Traffic and Transport***) for the year 2024 under Scenario 1. This is considered the worst case year for assessment as the earliest year for the start of construction. Any later years would have higher baseline traffic flows and

therefore a lesser impact magnitude. Assessments of construction commencing in later years (2026, 2028 and 2030) are included in ***Appendix 25.2.***

Table A25.11 Construction Road Traffic Flows – 2024 Scenario 1

Link ID	Description	2024 Baseline flows Annual Average Weekday Traffic (AAWT)		2024 Baseline + Scenario 1		Overall Change (%)	
		Total Vehicles	Total HGVs*	Total Vehicles	Total HGVs	Total Vehicles	Total HGVs
1	A12 north of the B1122	13,976	1,290	14,453	1,612	3.4	25.0
2	A12 between the B1122 and A1094	11,876	1,159	12,280	1,482	3.4	27.8
3	A12 south of the A1094	18,934	1,126	19,420	1,449	2.6	28.6
4	B1122 from the A12 to Lover's Lane	3,029	256	3,366	408	11.1	59.4
5	B1121 from the A12 to Friston	1,332	61	1,403	61	5.3	0.0
6	A1094 from the A12 to the B1121/B1069	8,191	517	8,644	820	5.5	58.7
7	B1122 from Friston to the A1094	1,340	70	1,382	70	3.1	0.0
8	A1094 from the B1121/B1069 to Aldeburgh	5,900	264	6,025	319	2.1	20.6
9	B1069 from the A1094 to Coldfair Green	4,364	201	4,966	469	13.8	133.7
10	B1122 from Aldeburgh to the B1353	3,646	181	3,770	235	3.4	30.2
11	B1353 from the B1122 to Thorpeness	2,265	90	2,353	135	3.9	49.9
12	Lover's Lane / Sizewell Gap	3,322	116	3,680	268	10.8	131.5
13	Aldringham Lane	2,712	118	2,750	118	1.4	0.0
14	B1069 from Lovers Lane to B1119	3,029	256	3,230	256	6.6	0.0
15	B1069 from Coldfair Green to B1119	4,364	201	4,560	201	4.5	0.0

*Heavy Goods Vehicle

37. Road links likely to experience an increase in traffic flows greater than 25% were assessed further by undertaking calculations of Basic Noise Level (BNL) (***Table A25.12***, under the 2024 Baseline versus a 2024 Baseline plus Scenario 1).

Table A25.12 Calculated BNL – 2024 Baseline vs. 2024 Baseline + Scenario 1 Traffic

Link ID	Description	Speed (mph)	2024 Baseline BNL, dBA $L_{10,18hr}$	2024 Baseline + Development Scenario 1 BNL, dBA, $L_{10,18hr}$	Overall Change dBA	Impact Magnitude
1	A12 north of the B1122	30.0	70.5	71.0	0.5	Negligible
		40.0	71.7	72.3	0.6	Negligible
2	A12 between the B1122 and A1094	30.0	69.9	70.5	0.6	Negligible
		50.0	72.5	73.0	0.5	Negligible
		60.0	73.8	74.3	0.5	Negligible
3	A12 south of the A1094	30.0	71.0	71.5	0.5	Negligible
		50.0	73.8	74.2	0.4	Negligible
4	B1122 from the A12 to Lover's Lane	30.0	63.6	64.9	1.3	Minor
		40.0	64.9	66.1	1.2	Minor
		60.0	67.7	68.7	1.0	Negligible
5	B1121 from the A12 to Friston	30.0	59.0	59.2	0.2	Negligible
		40.0	60.5	60.7	0.2	Negligible
		60.0	63.5	63.6	0.1	Negligible
6	A1094 from the A12 to the B1121/B1069	30.0	67.4	68.4	1.0	Minor
		40.0	68.8	69.7	0.9	Negligible
7	B1122 from Friston to the A1094	30.0	59.2	59.3	0.1	No change
		60.0	63.6	63.7	0.1	Negligible
8	A1094 from the B1121/B1069 to Aldeburgh	30.0	65.5	65.8	0.3	Negligible
		60.0	69.9	70.2	0.3	Negligible
9	B1069 from the A1094 to Coldfair Green	30.0	64.2	66.0	1.8	Minor
		40.0	65.7	67.3	1.6	Minor
10	B1122 from Aldeburgh to the B1353	30.0	63.5	64.0	0.5	Negligible
		40.0	65.0	65.4	0.4	Negligible
		60.0	67.9	68.3	0.4	Negligible

Link ID	Description	Speed (mph)	2024 Baseline BNL, dBA $L_{10,18hr}$	2024 Baseline + Development Scenario 1 BNL, dBA, $L_{10,18hr}$	Overall Change dBA	Impact Magnitude
11	B1353 from the B1122 to Thorpeness	30.0	61.2	61.8	0.6	Negligible
		60.0	65.7	66.1	0.4	Negligible
12	Lover's Lane / Sizewell Gap	60.0	67.2	68.3	1.1	Minor
13	Aldringham Lane	30.0	62.1	62.1	0.0	No change
		40.0	63.5	63.6	0.1	Negligible
14	B1069 from Lovers Lane to B1119	30.0	63.6	63.8	0.2	Negligible
15	B1069 from Coldfair Green to B1119	30.0	64.2	64.3	0.1	Negligible
		40.0	65.7	65.8	0.1	Negligible

38. ***Table A25.12*** shows that predicted impacts are at worst a minor adverse magnitude and therefore at all medium sensitivity receptors of **minor adverse** significance. Therefore, no additional mitigation is required.

25.3.2.2 Scenario 2

39. Operation of HDD rigs and ancillary equipment is expected to produce the greatest vibration impacts and is therefore taken forward as the worst case for vibration assessment under Scenario 1 and Scenario 2. For Scenario 1, there may be a higher number of equipment operating during however the distance to the NSR's remains the same and therefore the impact will remain minor adverse as presented in ***section 25.6.1.3*** of ***Chapter 25 Noise and Vibration***.

40. Under Scenario 2 each project is constructed as a standalone scheme, whereby any works are completed for East Anglia TWO (full reinstatement), and then East Anglia ONE North construction would follow at a later date. Therefore, in relation to vibration, the impact significance during construction of the proposed East Anglia TWO project alone (***section 25.6.1.3*** of ***Chapter 25 Noise and Vibration***) will then be the same for construction of the proposed East Anglia ONE North project alone at the landfall. Therefore, under Scenario 2, the cumulative impact with the proposed East Anglia ONE North project is as presented in ***section 25.6.1.2*** of ***Chapter 25 Noise and Vibration*** under the assessment of the proposed East Anglia TWO project and will be of **minor adverse** significance. Therefore no additional mitigation is required.

41. Vibration impacts from construction traffic under both Scenario 1 and Scenario 2 are considered to be of **minor adverse** significance. Therefore, there is no difference in impact between the two construction scenarios.

25.3.3 Cumulative Impact 3: Vibration Disturbance Along the Proposed Onshore Development Area

25.3.3.1 Scenario 1 and Scenario 2

42. Operation of HDD rigs and ancillary equipment is expected to produce the greatest vibration impacts and is therefore taken forward as the worst case for vibration assessment under Scenario 1 and Scenario 2. For Scenario 1, there may be a higher number of equipment operating during however the distance to the NSR's remains the same and therefore the impact will remain minor adverse as presented in ***section 25.6.1.3*** of ***Chapter 25 Noise and Vibration***.

43. Under Scenario 2 each project is constructed as a standalone scheme, whereby any works are completed for East Anglia TWO (full reinstatement), and then East Anglia ONE North construction would follow at a later date. Therefore, in relation to vibration, the impact significance during construction of the proposed East Anglia TWO project alone (***section 25.6.1.3*** of ***Chapter 25 Noise and Vibration***) will then be the same for construction of the proposed East Anglia ONE North project alone at the landfall. Therefore, under Scenario 2, the cumulative impact with the proposed East Anglia ONE North project is as presented in ***section 25.6.1.2*** of ***Chapter 25 Noise and Vibration*** under the assessment of the proposed East Anglia TWO project and will be of **minor adverse** significance. Therefore no additional mitigation is required.

44. Vibration impacts from construction traffic under both Scenario 1 and Scenario 2 are considered to be of **minor adverse** significance. Therefore, there is no difference in impact between the two construction scenarios.

25.4 Cumulative Impact Assessment during Operation

25.4.1 Cumulative Operational Impact 1: Increased Operational Noise on Residential Receptors from the Onshore Substations

45. SoundPLAN noise modelling software was utilised to predict the East Anglia ONE North and East Anglia TWO onshore substations cumulative operational noise from the normal anticipated site operational aspects of the projects. Operations are proposed 24 hours a day. The impact at each receptor from the proposed East Anglia TWO project in isolation was assessed in s***ection 25.6.2*** of ***Chapter 25 Noise and Vibration***.

46. The proposed East Anglia TWO project and the proposed East Anglia ONE North project will commit to a requirement limiting cumulative operational noise from the onshore substations to restrict noise to be no greater than 35dB $L_{Aeq\ 1hr}$ during

the day time no greater than 5dB above the background noise level (L A90 1hr) during the day time and 35dB $L_{Aeq\ 15\ min}$ during the night at the NSR's. The effect of this requirement will be such that noise emissions from the onshore substations will not exceed the prescribed limit at any receptors.

47. The impact of the predicted noise levels from the onshore substations (including the installation of harmonic filters) at surrounding residential receptors (medium sensitivity) are presented in below. The magnitude of effects has been assessed in accordance with BS 4142:2014 and against the 35dB $L_{Aeq\ 15\ min}$ requirement by comparison with impact criteria within ***Table 25.19*** of ***Chapter 25 Noise and Vibration***. Noise contour plots are provided in ***Appendix 25.3***.

48. ***Table A25.13*** shows the maximum operational noise impact (i.e. during the night).

Table A25.13 Predicted East Anglia TWO and East Anglia ONE North Substations Operational Noise Impact – Night time

Name	Receptor Sensitivity	Measured Background Noise Level (dBA)	Predicted Rating Noise Level Night time	Difference (dBA)	BS4142 Impact magnitude	Impact Significance Without Additional Mitigation	35db criteria impact magnitude	35db criteria Impact Significance
SSR1	Medium	33	31.1	-1.9	No Impact	Negligible	No Impact	Negligible
SSR2	Medium	27	33.6	6.6	Moderate	Moderate	No Impact	Negligible
SSR3	Medium	30	29.9	-0.1	No Impact	Negligible	No Impact	Negligible
SSR4*	Medium	27	30.5	3.5	Minor	Minor	No Impact	Negligible
SSR5	Medium	27	35.4	8.4	Moderate	Moderate	Negligible	Minor
SSR6*	Medium	27	28.4	1.4	Negligible	Minor	No Impact	Negligible
SSR7	Medium	35	29.2	-5.8	No Impact	Negligible	No Impact	Negligible
SSR8*	Medium	27	23.7	-3.3	No Impact	Negligible	No Impact	Negligible
SSR9	Medium	27	27.6	0.6	Negligible	Minor	No Impact	Negligible
SSR10	Medium	31	19.8	-11.2	No Impact	Negligible	No Impact	Negligible
SSR11	Medium	30	22.7	-7.3	No Impact	Negligible	No Impact	Negligible

Name	Receptor Sensitivity	Measured Background Noise Level (dBA)	Predicted Rating Noise Level Night time	Difference (dBA)	BS4142 Impact magnitude	Impact Significance Without Additional Mitigation	35db criteria impact magnitude	35db criteria Impact Significance
SSR12	Medium	28	20.8	-7.2	No Impact	Negligible	No Impact	Negligible
SSR13**	Medium	35	19.5	-15.5	No Impact	Negligible	No Impact	Negligible

Note: * Background taken from SSR5 and ** Background taken from SSR7

49. Using the BS4142 criteria, the results show that noise levels would be of no impact magnitude at most receptors of medium sensitivity during the night time and therefore of **negligible** significance, except for receptor SSR2, SSR4, SSR5, SSR6 and SSR9, where a **minor adverse** to **moderate adverse** significance are predicted using the BS4142 criteria.

50. However, against the requirement for limiting operational noise from the onshore substations to no greater than 35dB $L_{Aeq\ 15\ min}$ during the night at NSR's, the results show that noise levels would have an impact magnitude of no impact at all but one receptor location and therefore be of **negligible** significance.

51. Without additional mitigation, the predicted noise level of the substations operating will potentially give rise to an exceedance of the 35dB $L_{Aeq\ 15\ min}$ during the night noise limit at receptor SSR5, resulting in an impact significance of **minor adverse**. However, the Applicant will commit to a requirement cumulatively to not exceed 35dB $L_{Aeq\ 15\ min}$ during the night at NSR's.

52. Detailed mitigation for each project will be set out in an Operational Noise and Vibration Management Scheme to be agreed with the Local Authority. Additional mitigation measures likely to be considered as part of these schemes involve:

- Selection of quieter equipment;
- Installation of acoustic enclosures;
- Installation of acoustic barriers;
- Silencing of exhausts/outlets for air handling/cooling units; and
- Locating equipment to take advantage of screening inherent in the design.

53. Given the hard commitment to a comprehensive mitigation programme to reduce night time noise below the 35dB $L_{Aeq\ 15\ min}$ threshold, the residual impacts following mitigation are predicted to be of **negligible** significance at all locations.

25.5 Summary

54. *Error! Reference source not found.* gives an overarching summary of which of the two construction scenarios, detailed above, will be the realistic worst case in terms of impacts relating to noise and vibration.

Table A25.14 Summary of Scenario 1 and Scenario 2 Realistic Worst Case Assumptions

Impact	Worst Case	Notes
Impacts on residential receptors due to increased noise along the proposed onshore development route	N/A	Both construction scenarios are considered to be of negligible significance, therefore no difference between the two scenarios.
Impacts on residential receptors due to increase noise from off-site construction traffic	N/A	Both construction scenarios are considered to be of minor adverse significance with no difference between the two scenarios.
Impacts due to vibration disturbance along the proposed onshore development area	N/A	Both construction scenarios are considered to be of minor adverse significance, with no difference between the two scenarios.
Impacts on residential receptors due to increase in operational noise from the onshore substations	N/A	Operation impacts will be the same for both scenarios.

55. Overall, construction impacts to noise and vibration are of the same significance irrespective of construction scenario.

25.6 References

BSI, (2014) British Standards Institution [BS] 5228-1:2009+A1:2014 “Code of practice for noise and vibration control on construction and open sites – Part 1: Noise”.

BSI, (2014) British Standards Institution [BS] 5228-2: 2009+A1:2014 “Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration”.