

**The Great Grid Upgrade**

Sea Link

# Preliminary Environmental Information Report

Volume: 1

Part 2 Suffolk Onshore Scheme

Chapter 10 Noise and Vibration

Version A

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# Contents

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<b>2.10 Noise and Vibration</b>	<b>1</b>
2.10.1 Introduction	1
2.10.2 Regulatory and Planning Context	2
2.10.3 Scoping Opinion and Consultation	10
2.10.4 Approach and Methodology	12
2.10.5 Basis of Assessment	19
2.10.6 Study Area	22
2.10.7 Baseline Conditions	23
2.10.8 Mitigation	26
2.10.9 Preliminary Assessment of Effects	28
2.10.10 Summary	36
2.10.11 References	38

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## Table of Tables

Table 2.10.1: NPS EN-1 requirements relevant to noise and vibration	3
Table 2.10.2: NPS EN-5 requirements relevant to noise and vibration	5
Table 2.10.3: NPPF requirements relevant to noise and vibration	6
Table 2.10.4: PPGN noise exposure hierarchy	8
Table 2.10.5: Local Planning Policies relevant to noise and vibration	9
Table 2.10.6: Comments raised in the Scoping Opinion	10
Table 2.10.7: Criteria for determining value/sensitivity – Non-residential NSR	14
Table 2.10.8: Construction Noise LOAEL and SOAEL	15
Table 2.10.9: Magnitude of impact from construction noise	15
Table 2.10.10: Construction vibration effect levels	16
Table 2.10.11: Magnitude of impact of construction vibration	16
Table 2.10.12: Magnitude of impact from construction traffic	17
Table 2.10.13: Magnitude of impact of operational noise	17
Table 2.10.14: Significance matrix at non-residential NSR	18
Table 2.10.15: Flexibility assumptions	19
Table 2.10.16: Consideration of scenarios	20
Table 2.10.17: Consideration of Co-location	21
Table 2.10.18: Summary of measured noise levels	24
Table 2.10.19: Summary of representative background sound levels	25
Table 2.10.20: Preliminary assessment of construction noise	28
Table 2.10.21: Preliminary assessment of construction vibration	30
Table 2.10.22: Preliminary assessment of construction traffic noise	32
Table 2.10.23: Preliminary assessment of construction traffic vibration	33
Table 2.10.24: Preliminary assessment of operational noise	34
Table 2.10.25: Summary of preliminary effects of noise and vibration	36

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# Sea Link

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# 2.10 Noise and Vibration

## 2.10.1 Introduction

- 2.10.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents information about the preliminary environmental assessment of the likely significant noise and vibration effects at noise and vibration sensitive receptors (NSR) identified to date, that could result from Sea Link (hereafter referred to as the 'Proposed Project') (as described in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**).
- 2.10.1.2 This chapter describes the methodology used, the datasets that have informed the preliminary assessment, baseline conditions, mitigation measures and the preliminary noise and vibration residual significant effects that could result from the Proposed Project.
- 2.10.1.3 The draft Order Limits, which illustrate the boundary of the Proposed Project, are illustrated on **Figure 1.1.1 Draft Order Limits** and the Suffolk Onshore Scheme Boundary is illustrated on **Figure 1.1.2 Suffolk Onshore Scheme Boundary**.
- 2.10.1.4 This chapter should be read in conjunction with:
- **Volume 1, Part 1, Chapter 4, Description of the Proposed Project;**
  - **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology;**
  - **Volume 1, Part 1, Chapter 6, Scoping Opinion and EIA Consultation;**
  - **Volume 1, Part 2, Chapter 1, Evolution of the Suffolk Onshore Scheme;**
- 2.10.1.5 This chapter is supported by the following figures:
- **Figure 1.4.2 Saxmundham Converter Station Indicative Location;**
  - **Figure 2.10.1 Suffolk Noise and Vibration Baseline Information;**
  - **Figure 2.10.2 Suffolk Initial Construction Noise and Vibration Assessment – Proposed Project;** and
  - **Figure 2.10.2 Suffolk Initial Construction Noise and Vibration Assessment – Proposed Project Plus Co-location.**
- 2.10.1.6 This chapter is supported by the following appendices:
- **Volume 2, Part 1, Appendix 1.4.A, Outline Code of Construction Practice;**
  - **Volume 2, Part 1, Appendix 1.4.E, Construction Plant Schedule;**
  - **Volume 2, Part 1, Appendix 1.4.F, Outline Schedule of Environmental Commitment and Mitigation Measures;**
  - **Volume 2, Part 1, Appendix 2.10.A, Suffolk Noise Survey Data;**
  - **Volume 2, Part 1, Appendix 2.10.B, Suffolk Construction Noise and Vibration;** and

- **Volume 2, Part 1, Appendix 2.10.C, Suffolk Preliminary Operational Noise Assessment.**

## **2.10.2 Regulatory and Planning Context**

- 2.10.2.1 This section sets out the legislation and planning policy that is relevant to the preliminary noise and vibration assessment. A full review of compliance with relevant national and local planning policy will be provided within the Planning Statement that will be submitted as part of the application for Development Consent.
- 2.10.2.2 Policy generally seeks to minimise noise and vibration effects from development and to avoid significant adverse effects. This applies particularly to construction and operational noise and vibration.

### **Legislation**

#### **The Control of Pollution Act 1974**

- 2.10.2.3 The Control of Pollution Act 1974 (CoPA) (Ref 2.10.1) sets out the framework for the legislative control of construction noise and vibration on any given site. It also sets out the principle of 'best practicable means' (BPM) (as defined in Section 72 of the Act) and how that should be applied to construction activity noise. The Act refers to approved Codes of Practice, which include British Standards 5228 Part 1 (Ref 2.10.3) and Part 2 (Ref 2.10.4), as being relevant for the purposes of determining the BPM.
- 2.10.2.4 Section 61 of the Act states that consent may be sought from the relevant local authorities prior to the construction works commencing. If prior consent is sought, the relevant local authorities will need to be provided with information about the proposed construction works and how construction noise will be managed, including the use of BPM.

#### **Environmental Protection Act 1990**

- 2.10.2.5 Under Part III of the Environmental Protection Act 1990 (Ref 2.10.2) as amended by the Noise and Statutory Nuisance Act 1993, local authorities have a duty to investigate noise complaints relating to a variety of sources such as construction noise but excluding road traffic noise. If the local authority is satisfied that the noise amounts to a statutory nuisance it shall serve an Abatement Notice which may require that the noise be stopped altogether or limited to certain times.

## National Policy

### National Policy Statements

2.10.2.6 National Policy Statements (NPSs) set out the primary policy tests against which the application for a Development Consent Order (DCO) for the Proposed Project would be considered. A review of the NPS was announced in the 2020 Energy white paper: Powering our net zero future. This review was to ensure the NPSs were brought up to date to reflect the policies set out in the white paper. Table 2.10.1 and Table 2.10.2 below provides details of the elements of NPS for Energy (EN-1) (Ref 2.10.5) and NPS for Electricity Networks Infrastructure (EN-5) (Ref 2.10.6) that are relevant to this chapter, and how and where they are covered in the PEIR or will be covered within the Environmental Statement (ES).

Table 2.10.1: NPS EN-1 requirements relevant to noise and vibration

NPS EN-1 section	Where this is covered in the PEIR
<p><i>5.11.1 Excessive noise can have wide-ranging impacts on the quality of human life, health (for example owing to annoyance or sleep disturbance) and use and enjoyment of areas of value such as quiet places and areas with high landscape quality. The Government’s policy on noise is set out in the Noise Policy Statement for England. It promotes good health and good quality of life through effective noise management. Similar considerations apply to vibration, which can also cause damage to buildings. In this section, in line with current legislation, references to “noise” below apply equally to assessment of impacts of vibration.</i></p>	<p>The potential effects of noise and vibration during both construction and operational are considered in this chapter of the PEIR.</p>
<p><i>5.11.4 Where noise impacts are likely to arise from the proposed development, the applicant should include the following in the noise assessment:</i></p> <ul style="list-style-type: none"> <li><i>a description of the noise generating aspects of the development proposal leading to noise impacts, including the identification of any distinctive tonal, impulsive or low frequency characteristics of the noise;</i></li> <li><i>identification of noise sensitive premises and noise sensitive areas that may be affected;</i></li> <li><i>the characteristics of the existing noise environment;</i></li> <li><i>a prediction of how the noise environment will change with the proposed development;</i></li> <li><i>in the shorter term such as during the construction period;</i></li> </ul>	<p>A description of noise generating aspects of the Proposed Project and how the noise climate will change with the Proposed Project are provided in <b>Volume 2, Part 2, Appendix 1.4.E, Construction Plant Schedule, Volume 2, Part 2, Appendix 2.10.B Suffolk Construction Noise and Vibration</b>, and <b>Figure 2.10.2 Suffolk Initial Construction Noise and Vibration Assessment</b> in relation to construction noise, and <b>Volume 2, Part 2, Appendix 2.10.C, Suffolk Preliminary Operational Noise</b></p>

NPS EN-1 section	Where this is covered in the PEIR
<p><i>in the longer term during the operating life of the infrastructure; at particular times of the day, evening and night as appropriate.</i></p> <p><i>an assessment of the effect of predicted changes in the noise environment on any noise sensitive premises and noise sensitive areas; and</i></p> <p><i>measures to be employed in mitigating noise.</i></p> <p><i>The nature and extent of the noise assessment should be proportionate to the likely noise impact.</i></p>	<p><b>Assessment</b> in relation to operational noise. Results are summarised in Section 2.10.9.</p> <p>Noise sensitive receptors and characterisation of the existing noise environment are detailed in Section 2.10.7, <b>Volume 2, Part 2, Appendix 2.10.A, Suffolk Noise Survey Data, and Figure 2.10.1 Suffolk Noise and Vibration Baseline Information.</b></p>
<p><i>5.11.5 The noise impact of ancillary activities associated with the development, such as increased road and rail traffic movements, or other forms of transportation, should also be considered.</i></p>	<p>Construction traffic noise is assessed in Section 2.10.9 and <b>Volume 2, Part 2, Appendix 2.10.B, Suffolk Construction Noise and Vibration.</b></p>
<p><i>5.11.6 (part) Operational noise, with respect to human receptors, should be assessed using the principles of the relevant British Standards and other guidance. Further information on assessment of particular noise sources may be contained in the technology-specific NPSs. In particular, for renewables (EN-3) and electricity networks (EN-5) there is assessment guidance for specific features of those technologies. For the prediction, assessment and management of construction noise, reference should be made to any relevant British Standards and other guidance which also give examples of mitigation strategies.</i></p>	<p>The assessment of operational noise from the proposed Friston substation and Saxmundham Converter Station has been undertaken in accordance with relevant British standards, as described in Section 2.10.4, Section 2.10.9 and <b>Volume 2, Part 2, Appendix 2.10.C, Suffolk Preliminary Operational Noise Assessment.</b></p> <p>Details of noise and vibration mitigation are provided in Section 2.10.8, and <b>Volume 2, Part 2, Appendix 2.10.C, Suffolk Preliminary Operational Noise Assessment.</b></p>
<p><i>Draft EN-1: 5.12.16 (part) A development must be undertaken in accordance with statutory requirements for noise. Due regard must be given to the relevant sections of the Noise Policy Statement for England, the NPPF, and the government’s associated planning guidance on noise.</i></p>	<p>The assessment of noise and vibration considers the relevant sections of the stated documents as described in Table 2.10.3 and subsequent sections.</p>



Table 2.10.2: NPS EN-5 requirements relevant to noise and vibration

NPS EN-5 section	Where this is covered in the PEIR
<p>2.12.2 <i>All high voltage transmission lines have the potential to generate noise under certain conditions.</i></p>	<p>As described in <b>Volume 1, Part 1, Chapter 4, Description of the Proposed Project</b>, the proposed Suffolk Onshore Scheme includes a small section of realigned overhead lines. The proposal is to use a ‘quad-zebra’ conductor system. Additionally, there is a relatively large distance between the new transmission line and the nearest NSR. Significant adverse effects from noise from new overhead lines is therefore unlikely and is scoped out of further assessment.</p>
<p>2.12.9 <i>For the assessment of noise from overhead lines, the Applicant must use an appropriate method to determine the sound level produced by the line in both dry and wet weather conditions, in addition to assessing the impact on noise-sensitive receptors. For instance, the Applicant may use an appropriate noise modelling tool or tools for the prediction of overhead line noise and its propagation over distance. When assessing the impact of noise generated by overhead lines in wet weather relative to existing background sound levels, the Applicant should consider the effect of varying background sound levels due to rainfall. The Secretary of State is likely to regard it as acceptable for the Applicant to use a methodology that demonstrably addresses these criteria.</i></p>	<p>As above.</p>
<p>2.12.10 <i>Applicants must consider the following measures:</i></p> <ul style="list-style-type: none"> <li>● <i>the positioning of lines to help mitigate noise</i></li> <li>● <i>ensuring that the appropriately sized conductor arrangement is used to minimise potential noise</i></li> <li>● <i>quality assurance through manufacturing and transportation to avoid damage to overhead line</i></li> </ul>	<p>As above.</p>

NPS EN-5 section	Where this is covered in the PEIR
<p><i>conductors which can increase potential noise effects</i></p> <ul style="list-style-type: none"> <li><i>ensuring that conductors are kept clean and free of surface contaminants during stringing/installation</i></li> <li><i>the selection of the quietest cost-effective plant available</i></li> </ul>	
<p>2.12.11 <i>In addition, the ES should include information on planned maintenance arrangements. Where detail is not included, the Secretary of State should consider stipulating 13 For example BS4142. National Policy Statement for Electricity Networks Infrastructure (EN-5) 24 appropriate maintenance arrangements by way of requirements attached to any grant of development consent.</i></p>	<p>Details of proposed maintenance activities are provided in <b>Volume 1, Part 1, Chapter 4, Description of the Proposed Project.</b></p>

2.10.2.7 There are no other new or materially different policy considerations for the noise and vibration assessment within the Draft EN-5 (Ref 2.10.7), when compared to the current EN-5 (Ref 2.10.6).

### National Planning Policy Framework

2.10.2.8 The National Planning Policy Framework (NPPF) (Ref 2.10.8) has the potential to be considered important and relevant to the Secretary of State’s (SoS) consideration of the Proposed Project. Table 2.10.3 below provides details of the elements of the NPPF that are relevant to this chapter, and how and where they are covered in the PEIR or will be covered within the ES.

Table 2.10.3: NPPF requirements relevant to noise and vibration

NPPF section	Where this is covered in the PEIR
<p><i>174 ‘preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans.’</i></p>	<p>The potential effects of noise and vibration during both construction and operational are considered in this chapter of the PEIR.</p>
<p><i>185 mitigate and reduce to a minimum, potential adverse impacts resulting from noise from new development – and avoid noise giving rise to</i></p>	<p>The assessment of operational noise from the proposed Saxmundham</p>

NPPF section	Where this is covered in the PEIR
<p><i>significant adverse impacts on health and the quality of life; and identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.</i></p>	<p>Converter Station has been undertaken in accordance with relevant British standards, as described in Section 2.10.3.3, Section 2.10.9, and <b>Volume 2, Part 2, Appendix 2.10.C, Suffolk Preliminary Operational Noise Assessment.</b></p> <p>Details of noise and vibration mitigation are provided in Section 2.10.8, and <b>Volume 2, Part 2, Appendix 2.10.C, Suffolk Preliminary Operational Noise Assessment.</b></p>

## Noise Policy Statement for England

- 2.10.2.9 The long-term vision of Government noise policy is set out in the Noise Policy Statement for England (NPSE) (Ref 2.10.9) published in March 2010. Through effective management and control of environmental noise within the context of Government policy on sustainable development, the NPSE aims to:
- avoid significant adverse impacts on health and quality of life;
  - mitigate and minimise other adverse impacts on health and quality of life; and
  - contribute to improvements to health and quality of life, where possible.
- 2.10.2.10 The Explanatory Note to the NPSE assists in the definition of significant adverse and adverse, as stated in the NPPF, with reference to No Observed Effect Level (NOEL), Lowest Observed Adverse Effect Level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) values:
- NOEL: the level of noise exposure below which no effect at all on health or quality of life can be detected;
  - LOAEL: the level of noise exposure above which adverse effects on health and quality of life can be detected; and
  - SOAEL: the level of noise exposure above which significant adverse effects on health and quality of life occur.
- 2.10.2.11 The Government policy and guidance do not state values for the NOEL, LOAEL and SOAEL. Rather, it considers that they are different for different noise sources, for different receptors, and at different times, and they should be defined on a strategic or project basis considering the specific features of that area, source, or project.

## National Planning Practice Guidance

2.10.2.12 Planning Practice Guidance for Noise (PPGN) (Ref 2.10.10) was published in March 2014 and updated in July 2019. It provides advice on how planning can manage potential noise impacts related to new development. It states that:

*“Noise needs to be considered when development may create additional noise or would be sensitive to the prevailing acoustic environment (including any anticipated changes to that environment from activities that are permitted but not yet commenced).”*

2.10.2.13 It also states that: *“...it is important to look at noise in the context of the wider characteristics of a development proposal, its likely users and its surroundings, as these can have an important effect on whether noise is likely to pose a concern”.*

2.10.2.14 The guidance also advises that plan-making and decision making need to take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.

2.10.2.15 PPGN provides a noise exposure hierarchy explaining how effects of noise can be categorised, as reproduced in Table 2.10.4.

Table 2.10.4: PPGN noise exposure hierarchy

Response	Example of outcomes	Increasing effect level	Action
<b>No Observed Effect Level (NOEL)</b>			
Not present	No effect	No Observed Effect	No specific measures required
<b>No Observed Adverse Effect Level (NOAEL)</b>			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not so much that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
<b>Lowest Observed Adverse Effect Level (LOAEL)</b>			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude, or other physiological response, e.g., turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is	Observed Adverse Effect	Mitigate and reduce to a minimum



Response	Example of outcomes	Increasing effect level	Action
	a small actual or perceived change in the quality of life.		
<b>Significant Observed Adverse Effect Level (SOAEL)</b>			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g., avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening, and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g., regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g., auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

## Local Planning Policy

2.10.2.16 The Suffolk Onshore Scheme Boundary (refer to **Figure 1.1.2 Suffolk Onshore Scheme Boundary**) lies within the jurisdiction of East Suffolk Council. Local planning policy for East Suffolk Council consists of two parts:

- Suffolk Coastal Local Plan, adopted in September 2020 (Ref 2.10.11); and
- Waveney Local Plan, adopted in March 2019 (Ref 2.10.12) (which covers the former Suffolk Coastal and Waveney Districts).

2.10.2.17 The Suffolk Onshore Scheme Boundary lies within the boundary of the Suffolk Coastal Local Plan (adopted in September 2020) (Ref 2.10.11). Local Plan policies which are relevant to noise and vibration matters and will inform the assessment in the ES are detailed in Table 2.10.5.

Table 2.10.5: Local Planning Policies relevant to noise and vibration

Suffolk Coastal Local Plan, adopted September 2020 – Policy	Where this is covered in the PEIR
10.3: Environmental Quality The objective of policy 10.3 is to ensure that potential development will not adversely affect	The assessment of operational noise from the proposed Saxmundham Converter Station has been

Suffolk Coastal Local Plan, adopted September 2020 – Policy	Where this is covered in the PEIR
existing sensitive locations due to various types of pollution, including noise and vibration.	<p>undertaken in accordance with relevant British Standards (BS), as described in Section 2.10.4, Section 2.10.9, and <b>Volume 2, Part 2, Appendix 2.10.C, Suffolk Preliminary Operational Noise Assessment.</b></p> <p>Details of noise and vibration mitigation are provided in Section 2.10.8, and <b>Volume 2, Part 2, Appendix 2.10.C, Suffolk Preliminary Operational Noise Assessment.</b></p>

## 2.10.3 Scoping Opinion and Consultation

### Scoping

- 2.10.3.1 A Scoping Report (Ref 2.10.13) for the Proposed Project was issued to the Planning Inspectorate (PINS) on 24 October 2022 and a Scoping Opinion (Ref 2.10.14) was received from the SoS on 1 December 2022. Table 2.10.6 sets out the comments raised in the Scoping Opinion and how these have been addressed in this PEIR or will be addressed within the ES. The Scoping Opinion takes account of responses from prescribed consultees as appropriate.

Table 2.10.6: Comments raised in the Scoping Opinion

ID	Inspectorate's comments	Response
3.9.1	<p><i>[Operational vibration – all options]</i></p> <p>The Inspectorate does not agree to scope this matter out given the uncertainties regarding the chosen location of the converter station and the proximity to sensitive receptors. The Scoping Report provides limited information regarding anticipated operational vibration levels.</p> <p>The ES should provide an assessment of operational vibration or the information demonstrating agreement with relevant stakeholders and the absence of likely significant effects.</p>	<p>Information relating to the proposed location and indicative design of the Friston Substation and Saxmundham Converter Station is now available, as detailed in <b>Volume 1, Part 1, Chapter 4, Description of the Proposed Project.</b> There are no proposed plant items where vibration levels would be deemed significant even immediately next to the plant. There is significant distance between the proposed substation and converter station, and nearby NSR. Adverse and significant</p>

ID	Inspectorate's comments	Response
3.9.2	<p data-bbox="411 450 901 517"><i>[Operational road traffic noise and vibration – all options]</i></p> <p data-bbox="411 533 970 712">The Inspectorate agrees to scope this matter out on the basis that operational traffic movements are likely to be infrequent and unlikely to give rise to likely significant effects.</p>	<p data-bbox="1038 215 1461 427">adverse effects from operational vibration are therefore highly unlikely and are scoped out of further assessment. This will be kept under review for the ES.</p> <p data-bbox="1038 450 1441 517">Operational traffic is scoped out of further assessment.</p>
3.9.3	<p data-bbox="411 734 831 766"><i>[Construction traffic vibration]</i></p> <p data-bbox="411 781 1002 1070">Construction vehicle routes are currently unknown and therefore so is the distance to sensitive receptors. In addition, the number and type of vehicles have not yet been confirmed. In the absence of this detail, the Inspectorate does not agree to scope out construction traffic vibration for the construction phase at this time.</p>	<p data-bbox="1038 734 1461 913">Construction traffic vibration considered in <b>Volume 2, Part 2, Appendix 2.10.B, Suffolk Construction Noise and Vibration</b> and Section 2.10.9.</p>
3.9.4	<p data-bbox="411 1093 938 1160"><i>[Switchgear and auxiliary equipment operational noise]</i></p> <p data-bbox="411 1176 1007 1899">This matter is proposed to be scoped out on the basis that switchgear noise emissions would be impulsive in character and operation would be infrequent. It is further stated that auxiliary plant comprising standby generators and air compressors would contribute to the broadband noise; however, these would not run continuously and would be housed and used as emergency back-up only. The Inspectorate agrees that this matter can be scoped out of further assessment. The ES should contain relevant engineering specifications to demonstrate that switchgear operation is unlikely to result in significant effects and should demonstrate that consultation has been undertaken with the relevant consultation bodies.</p>	<p data-bbox="1038 1093 1461 1305">Operational noise from auxiliary and backup items is scoped out of further assessment. Further details will be provided in the ES as appropriate.</p> <p data-bbox="1038 1321 1461 1682">There are no sources of operational noise at the proposed Friston Substation other than auxiliary equipment and switchgear, with no transformers or other reactive plant proposed. Operational noise from the proposed Friston Substation is therefore scoped out.</p>
3.9.5	<p data-bbox="411 1921 943 1989"><i>[Operational noise and vibration from underground cables – operation]</i></p> <p data-bbox="411 2004 991 2078">The Inspectorate agrees that operational noise and vibration from underground</p>	<p data-bbox="1038 1921 1430 2078">Operational noise and vibration from underground cables is scoped out of further assessment.</p>

ID	Inspectorate's comments	Response
	cables is unlikely to result in significant effects and agrees that this matter can be scoped out of the ES.	
3.9.6	<p>[Mitigation measures]</p> <p>The Scoping Report refers to noise mitigation measures which include screening and enclosures. The ES should address the potential adverse effects of mitigation measures in the relevant aspect chapters of the ES (e.g. Landscape and Visual) where significant effects are likely to occur.</p>	Landscape and visual effects are considered in <b>Volume 2, Part 2, Chapter 2, Landscape and Visual.</b>

2.10.3.2 Based on the Inspectorates comments, construction traffic vibration has been added to the scope of the assessment. Operational vibration is maintained as being scoped out of the assessment as there are no material sources of vibration proposed as part of the Suffolk Onshore Scheme.

## Consultation and Project Engagement

2.10.3.3 National Grid Electricity Transmission plc (National Grid) have consulted with the environmental protection departments of East Suffolk Council regarding the assessment of noise and vibration from the Proposed Project and the noise survey methodology during a meeting held on 28 April 2023. The proposed assessment methodologies were discussed and the results of these discussions are considered in the assessments described in this chapter. Subsequent liaison has been held with regards to the baseline noise survey methodology and locations. Following the baseline noise survey, representative background noise levels for use within the operational noise assessment have been communicated to East Suffolk Council.

## 2.10.4 Approach and Methodology

2.10.4.1 **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology** sets out the overarching approach which has been used in developing the preliminary environmental information. This section describes the technical methods used to determine the baseline conditions, sensitivity of the receptors and magnitude of effects and sets out the significance criteria that have been used for the preliminary noise and vibration assessment.

## Guidance Specific to the Noise and Vibration Assessment

2.10.4.2 The preliminary noise and vibration assessment has been carried out in accordance with the following good practice guidance documents:

- British Standard 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise (BS 5228-1) (Ref 2.10.3);
- British Standard 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration (BS 5228-2) (Ref 2.10.4);



- Design Manual for Roads and Bridges LA 111 – Noise and Vibration (DMRB LA 111) (Ref 2.10.15);
- Calculation of Road Traffic Noise, 1988 (CRTN) (Ref 2.10.16);
- ISO 9613-2:1996 Acoustics – Attenuation of sound during propagation outdoors – Part 2: General method of calculation (ISO 9613) (Ref 2.10.17);
- British Standard 4142:2014+A1:2019. Methods for rating and assessing industrial and commercial sound (BS 4142) (Ref 2.10.18);
- Association of Noise Consultants (ANC) BS 4142:2014+A1:2019 Technical Note, 2020 (Ref 2.10.19);
- British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings (BS 8233) (Ref 2.10.20); and
- British Standard 7445-1:2003 – Description and measurement of environmental noise – Part 1: Guide to quantities and procedures (BS 7445-1) (Ref 2.10.21).

## Baseline Data Gathering and Forecasting Methods

### Data sources

2.10.4.3 A baseline assessment has been informed by a desk study which has drawn on the following information sources:

- Defra strategic noise mapping (2017) (Ref 2.10.22);
- Ordnance Survey (OS) mapping;
- OS AddressBase Plus data;
- traffic data provided by the Traffic and Transport consultant; and
- noise survey data.

### Noise survey methodology

2.10.4.4 The operational noise assessment has been informed by noise survey data obtained from six locations representative of nearby NSR, as shown in **Figure 2.10.1 Suffolk Noise and Vibration Baseline Information**. The noise survey was conducted in accordance with BS 7445-1 (Ref 2.10.21) and BS 4142 (Ref 2.10.18). The survey was conducted between Thursday, 22 June and Monday, 3 July 2023. The sound level meter measured a range of parameters including the following:

- $L_{Aeq,T}$  – The A-weighted equivalent continuous sound pressure level over the measurement period T, representative of the ‘average’ sound pressure level over a given period, in this case 15 minutes.
- $L_{A90,T}$  – The A-weighted noise level that is exceeded for 90% of the measurement period, and is usually regarded as a descriptor of the background noise level.
- $L_{AFmax,T}$  – the maximum A-weighted noise level during the sample period, measured using a fast time weighting.

2.10.4.5 Broadband and 1/3 octave band values were measured for the above parameters.

- 2.10.4.6 The measurement periods and durations were appropriate to the measurement required. Microphones were fitted with windshields and the microphone was mounted between 1.3 m – 1.5 m from ground level. The measurement locations were free-field, at least 3.5 m from any reflective surfaces, other than the ground. Weather conditions were monitored during the survey, with periods of rain and wind speeds greater than 5 metres per second (m/s) excluded from the assessment.
- 2.10.4.7 The sound level meters were calibrated at the start and end of the survey period with no significant drift observed.

## Assessment Criteria

### Sensitivity

- 2.10.4.8 The sensitivity of NSR is determined partly on property type, for example residential properties are of a higher sensitivity than factories and offices.
- 2.10.4.9 Although all residential NSR are sensitive to noise and vibration, there are also cases where the sensitivity of an NSR may depend on the pre-existing noise climate. For example, NSR falling within existing high noise areas (such as Noise Important Areas (NIA)) may be more sensitive to increases in noise than those outside NIA. Consideration would be given to such instances as part of the assessment of construction impacts.
- 2.10.4.10 The sensitivity of residential NSR is factored into the assessment methodologies. However, additional consideration of sensitivity may be required in certain cases for non-residential NSR. The criteria used to determine the value and sensitivity of non-residential NSR specific to noise and vibration are set out in Table 2.10.7. These values are based on standard practice.

Table 2.10.7: Criteria for determining value/sensitivity – Non-residential NSR

Sensitivity/value	Criteria
High	Schools and education premises, hospitals, clinics, care homes, places of worship, community centres, libraries, dwellings within NIA (in relation to road traffic noise)
Medium	Areas primarily used for leisure activities including Public Rights of Way (PRoW), sports facilities and sites of historic or cultural importance, camp sites, hotels, gardens, parks
Low	Offices, cafes/bars with external areas
Negligible	Industrial or retail premises

## Magnitude

### Construction noise assessment criteria

- 2.10.4.11 Initial construction noise impacts have been assessed in accordance with BS 5228-1 (Ref 2.10.3) and with the guidance of DMRB LA 111 (Ref 2.10.15).
- 2.10.4.12 Distances within which the various construction noise magnitude threshold values would be exceeded have been calculated for each construction activity in accordance with the methodology described in Annex F of BS 5228-1. The thresholds are set relative to the lower noise thresholds (Category A) as detailed in Section E.3.2 of BS 5228-1 (the 'ABC' method). The Category A construction noise thresholds represents the lowest assessment criteria (typically used to assess impacts in rural areas) and are proposed to be used throughout the EIA as a worst-case.
- 2.10.4.13 The LOAEL and SOAEL are established in accordance with Table 2.10.8.

Table 2.10.8: Construction Noise LOAEL and SOAEL

Time period	LOAEL	SOAEL
Weekdays 7:00am to 7:00pm, and Saturdays 7:00am to 1:00pm	50 dB LAeq,T	65 dB LAeq,T
Weekdays 7:00pm to 11:00pm, Saturdays 1:00pm to 11:00pm, and Sundays 7:00am to 11:00pm	50 dB LAeq,T	55 dB LAeq,T
Night-time 11:00pm to 7:00am	40 dB LAeq,T	45 dB LAeq,T

- 2.10.4.14 The assessment highlights NSR potentially falling within the various threshold distances. BPM would be employed to reduce construction noise levels. However, for the purposes of this assessment, specific mitigation measures, such as screening, are not included in the calculations (except for certain plant items, such as: generators, compressors, and jackhammers). This is so that construction noise 'hot-spots' can be highlighted and specific noise mitigation measures can be identified to avoid significant adverse effects.
- 2.10.4.15 The magnitude of impact of construction noise would be determined against the criteria specified by DMRB LA 111: Noise and vibration (National Highways, 2020), as detailed in Table 2.10.9.

Table 2.10.9: Magnitude of impact from construction noise

Magnitude	Construction noise level
Large	Above or equal to SOAEL +5 dB
Medium	Above or equal to SOAEL and below SOAEL +5 dB
Small	Above or equal to LOAEL and below SOAEL
Negligible	Below LOAEL

### Construction vibration assessment criteria

- 2.10.4.16 The distances within which construction vibration threshold levels would be exceeded have been calculated in accordance with the methodologies described in BS 5228-2 (Ref 2.10.4) for each applicable activity.
- 2.10.4.17 Construction vibration effect threshold levels, including applicable LOAEL and SOAEL are presented in Table 2.10.10.

Table 2.10.10: Construction vibration effect levels

<b>Vibration level mm/s PPV*</b>	<b>Effect</b>
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments (LOAEL).
1.0	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents (SOAEL).
10	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.

\* millimetres per second peak particle velocity

- 2.10.4.18 The assessment highlights NSR potentially falling within the various threshold distances for each activity. Although in practice BPM would be employed to reduce construction vibration levels, for the purposes of this assessment specific mitigation measures are not included in the calculations. This is so that construction vibration 'hot-spots' can be highlighted and specific noise mitigation measures can be identified to avoid significant adverse effects.
- 2.10.4.19 The magnitude of impact of construction vibration would be determined against the criteria specified by DMRB LA 111 (Ref 2.10.15), as detailed in Table 2.10.11.

Table 2.10.11: Magnitude of impact of construction vibration

<b>Magnitude</b>	<b>Construction vibration level</b>
Large	Above or equal to 10 mm/s PPV
Medium	Above or equal to SOAEL and below 10 mm/s PPV
Small	Above or equal to LOAEL and below SOAEL
Negligible	Below LOAEL



### Construction traffic noise assessment criteria

- 2.10.4.20 Noise from construction traffic on the public highway would be calculated in accordance with CRTN (Ref 2.10.16) and assessed against the criteria detailed in DMRB LA 111 (Ref 2.10.15). The basic noise level (BNL) from roads within the construction traffic study area would be calculated in accordance with CRTN for the 'do-nothing' and 'do-something' scenarios in the construction year.
- 2.10.4.21 The calculated BNL values for the 'do-minimum' and 'do-something' scenarios in the construction year would be compared to determine the magnitude of the impact in accordance with criteria specified by DMRB LA 111 as detailed in Table 2.10.12.

Table 2.10.12: Magnitude of impact from construction traffic

<b>Magnitude</b>	<b>Increase in BNL of closest public road used for construction traffic (dB)</b>
Large	Greater than or equal to 5.0
Medium	Greater than or equal to 3.0 and less than 5.0
Small	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

### Operational noise assessment criteria

- 2.10.4.22 The noise rating level will be compared to the background sound level to determine the magnitude of impact with reference to the methodology described in BS 4142 (Ref 2.10.18). The magnitude of impact of operational noise is determined against the criteria detailed in Table 2.10.13.

Table 2.10.13: Magnitude of impact of operational noise

<b>Magnitude</b>	<b>Comparison of sound rating level and background sound level</b>
Large	Rating level > 10 dB above the background sound level (SOAEL)
Medium	Rating level between 5 and 9 dB above background sound level (LOAEL)
Small	Rating level between 0 and 4 dB above background sound level
Negligible	Rating level below background sound level

- 2.10.4.23 It is anticipated that further detailed assessment of operational noise from the proposed Saxmundham Converter Station, once the design has been finalised, detailing specific mitigation measures would be secured via a requirement attached to the DCO, if granted. The assessment will therefore focus on setting of noise limits such that adverse impacts are avoided.

- 2.10.4.24 Although the above criteria will be used to assess the magnitude of impact, it is standard practice to aim for a sound rating level not to exceed the background sound level, such that the impact is 'low' (as defined in BS 4142), or negligible in terms of the impact magnitude definition defined in Table 2.10.13 above. Additionally, the local authority aim is for the rating level to be at least 5 dB below the background sound level, where feasible.
- 2.10.4.25 Consideration, will also be taken of context, as defined in BS 4142 (Ref 2.10.16), for the final determination of significance; in particular, absolute noise levels.
- 2.10.4.26 Taking account of the guidance provided by BS 4142, the ANC Technical Note (Ref 2.10.19), BS 8233 (Ref 2.10.20), and PPGN (Ref 2.10.10), where background sound levels are 'low' (less than about 30 dB L<sub>A90</sub>), the SOAEL is defined as follows:
- SOAEL: rating level >34 dB L<sub>Ar,Tr</sub> or ≥10 dB above the background sound level, whichever is higher.

### Significance of effects

- 2.10.4.27 At residential NSR, large and medium magnitude effects are typically considered to be significant, whilst minor and negligible effects are considered to be not significant.
- 2.10.4.28 At non-residential NSR the significance of effect is based on the significance matrix provided in Table 2.10.14.

Table 2.10.14: Significance matrix at non-residential NSR

		NSR sensitivity:			
		High	Medium	Low	Negligible
Impact magnitude	Large	Major	Major	Moderate	Minor
	Medium	Moderate	Moderate	Minor	Negligible
	Small	Moderate	Minor	Negligible	Negligible
	Negligible	Minor	Negligible	Negligible	Negligible

- 2.10.4.29 Major and moderate effects are typically considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement would also be applied in reaching conclusions as to the significance of effects at specific non-residential NSR.
- 2.10.4.30 With regards to construction noise and vibration, significant effects are deemed to occur where the impact occurs for a period of at least ten days in any 15 consecutive days or 40 days in any consecutive six-month period, based on guidance from BS 5228-1 (Ref 2.10.3) and DMRB LA 111 (Ref 2.10.15).
- 2.10.4.31 As set out in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology** the general approach taken to determining the significance of effect in this preliminary assessment is only to state whether effects are likely or unlikely to be significant, rather than assigning significance levels.

## Assumptions and Limitations

- 2.10.4.32 The assessment is based on currently available information for the Proposed Project. It is assumed that third party data is accurate.

### 2.10.5 Basis of Assessment

- 2.10.5.1 This section sets out the assumptions that have been made in respect of design flexibility maintained within the Proposed Project and the consideration that has been given to alternative scenarios and the sensitivity of the preliminary assessment to changes in the construction commencement year.
- 2.10.5.2 Details of the available flexibility and assessment scenarios are presented in **Volume 1, Part 1, Chapter 4, Proposed Project Description** and **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology**.

### Flexibility Assumptions

- 2.10.5.3 The main preliminary assessments have been undertaken based on the description of the Proposed Project provided in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**. To take account of the flexibility allowed in the Proposed Project, consideration has been given to the potential for preliminary effects to be of greater or different significance should any of the permanent or temporary infrastructure elements be moved within the Limits of Deviation (LoD) or draft order Limits.
- 2.10.5.4 The assumptions made regarding the use of flexibility for the main assessment, and any alternatives assumptions are set out in Table 2.10.15 below.

Table 2.10.15: Flexibility assumptions

<b>Element of flexibility</b>	<b>Proposed Project assumption for initial preliminary assessment</b>	<b>Flexibility assumption considered</b>
Lateral LoD high voltage direct current (HVDC)/high voltage alternating current (HVAC) cables	The preliminary assessment of construction noise and vibration effects considers works occurring at the extent of the LoD boundary as a worst-case.	The preliminary assessment of construction noise and vibration impacts has already considered a worst-case and therefore no further flexibility in assumptions has been considered.
Lateral LoD Saxmundham Converter Station	The preliminary assessment of construction noise and vibration effects considers works occurring at the extent of the LoD boundary as a worst-case.	The preliminary assessment of construction noise and vibration impacts has already considered a worst-case and therefore no further flexibility in assumptions has been considered.
	The preliminary assessment of operational noise effects from the proposed Saxmundham	The potential implication of operational noise impacts due to movement of the proposed

<b>Element of flexibility</b>	<b>Proposed Project assumption for initial preliminary assessment</b>	<b>Flexibility assumption considered</b>
	Converter Station if based on the proposed location shown in <b>Figure 1.4.2 Saxmundham Converter Station Indicative Location</b> .	Saxmundham Converter Station anywhere within the LoD are considered qualitatively.
Vertical LoD Saxmundham Converter Station	The vertical LoD for the Saxmundham Converter Station would not have a material effect on the assessment of construction noise and vibration or operational noise impacts.	No likely change in outcome due to flexibility.

## Consideration of Scenarios and Options

2.10.5.5 There are three scenarios which have been considered by the preliminary assessment. These are:

- Friston Substation is installed either under the current consent sought by Scottish Power Renewables (SPR) or as part of the Proposed Project, as explained in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**;
- Saxmundham Converter Station construction access is taken off the B1121 South Entrance (bellmouth BM09) or the B1121 Main Road (bellmouth BM12 via BM11 and BM10), as explained in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**; and
- Saxmundham Converter Station permanent access is taken off the B1121 South Entrance (bellmouth BM09), B1121 Main Road (bellmouth BM12 via BM11 and BM10) or off the B1121 The Street (bellmouth BM13), as explained in **Volume 1, Part 1, Chapter 4, Description of the Proposed Project**.

2.10.5.6 Table 2.10.16 details where these scenarios are relevant to the preliminary landscape and visual assessment and how they have been assessed and reported in Section 2.10.9, preliminary assessment of effects.

Table 2.10.16: Consideration of scenarios

<b>Assessment scenario</b>	<b>How it has been considered within the preliminary assessment</b>
Friston Substation	<p>The preliminary assessment of construction noise and vibration impacts considers a worst-case and includes the potential construction of Friston substation as part of the Proposed Project.</p> <p>There are no material sources of operational noise proposed as part of the Friston Substation (other than auxiliary items). Operational noise is therefore scoped out of further assessment.</p>

<b>Assessment scenario</b>	<b>How it has been considered within the preliminary assessment</b>
Saxmundham Converter Station construction access	The preliminary assessment of construction noise and vibration effects considers both, potential construction accesses are constructed, as a worst-case.
Saxmundham Converter Station permanent access	The preliminary assessment of construction noise and vibration effects considers the three potential permanent accesses are constructed, as a worst-case.

## Coordination Including Co-location

- 2.10.5.7 The Proposed Project includes an option for co-location with other National Grid Ventures proposed Nautilus and LionLink (formerly known as EuroLink) interconnector projects as explained in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology**.
- 2.10.5.8 Table 2.10.17 details where the option of co-location is relevant to the preliminary noise and vibration assessment and how this option has been assessed and reported in Section 2.10.9.

Table 2.10.17: Consideration of Co-location

<b>Element of co-location</b>	<b>How it has been considered within the preliminary assessment</b>
HVDC ducts	The preliminary assessment of construction noise and vibration effects considers both scenarios (Proposed Project and Proposed Project with Co-location). However, as the assessment considers potential works taking place at the LoD boundary, the outcome is in principle the same for both scenarios as a worst-case.
HVAC ducts	The preliminary assessment of construction noise and vibration effects considers both scenarios (Proposed Project and Proposed Project with Co-location). However, as the assessment considers potential works taking place at the LoD boundary, the outcome is in principle the same for both scenarios as a worst-case.
Saxmundham Converter Station	The preliminary assessment of operational noise considers the proposed Saxmundham Converter Station based on the proposed location shown in <b>Figure 1.4.2 Saxmundham Converter Station Indicative Location</b> . The potential implications on operational noise impacts due to co-location of converter stations have also been considered qualitatively as part of the preliminary assessment.



<b>Element of co-location</b>	<b>How it has been considered within the preliminary assessment</b>
Friston Substation	No option has been included for co-location as part of the Proposed Project. This is assessed cumulatively in <b>Part 2, Chapter 14 Suffolk Onshore Scheme Inter-project Cumulative Effects</b> .
Suffolk landfall	Separate assessment of potential construction noise and vibration impacts due to co-location of the landfall are provided.

## Sensitivity Test

- 2.10.5.9 It is likely that under the terms of the draft DCO, construction could commence in any year up to five years from the granting of the DCO which is assumed to be 2026. Consideration has been given to whether the preliminary effects reported would be any different if the works were to commence in any year up to year five. Where there is a difference, this is reported in Section 2.10.9, preliminary assessment of effects.

## 2.10.6 Study Area

- 2.10.6.1 This section describes the study areas for the various noise and vibration assessment. The study areas are shown graphically in **Figure 2.10.1 Suffolk Noise and Vibration Baseline Information**.

### Construction Noise Study Area

- 2.10.6.2 The proposed study area for construction noise effects would include NSR within 300 m from the draft Order Limits/construction works associated with the Proposed Project, excluding traffic on the public highway which is considered separately below. This is based on guidance in BS 5228-1 (Ref 2.10.3) and DMRB LA 111 (Ref 2.10.15).

### Construction Vibration Study Area

- 2.10.6.3 The proposed study area for construction vibration effects, based on guidance from BS 5228-2 (Ref 2.10.4) and DMRB LA 111 (Ref 2.10.15), comprises 100 m from the closest construction activity with the potential to generate vibration impacts at NSR.

### Construction Traffic Noise Study Area

- 2.10.6.4 Noise from construction traffic on the existing road network would be assessed for each applicable road. The assessment would consider the change in BNL, calculated in line with the methodology described in CRTN (Ref 2.10.16), with a subsequent assessment of the impacts on NSR within 50 m of routes where potential significant effects are identified.

### Operational Noise Study Area

- 2.10.6.5 The proposed study area for operational noise effects from the proposed Saxmundham Converter Station, based on guidance from ISO 9613 (Ref 2.10.17), would include NSR within 1km of the converter station, with a particular focus on the nearest NSR.

## 2.10.7 Baseline Conditions

2.10.7.1 This section describes the baseline noise and vibration conditions in the noise and vibration study area for the Suffolk Onshore Scheme. Baseline information is shown graphically in **Figure 2.10.1 Suffolk Noise and Vibration Baseline Information**.

### Noise Sensitive Receptors

2.10.7.2 There are built-up residential areas at:

- Saxmundham to the west;
- Friston to the south;
- Goldfair Green to the south;
- Aldeburgh to the southeast;
- Sizewell to the northeast; and
- Leiston to the northeast.

2.10.7.3 There are also isolated NSR and small settlements within the noise and vibration study area located between the main built-up residential areas identified above.

2.10.7.4 With regards to operational noise from the proposed Saxmundham Converter Station, the site is surrounded by predominantly isolated residential NSR in all directions. The nearest NSR are located approximately 300 m from the proposed converter station site; R\_5764 and R\_14222, to the south and northwest, respectively (based on the proposed location shown in **Figure 1.4.2 Saxmundham Converter Station Indicative Location**). The nearest built-up areas are the town of Saxmundham, located approximately 600 m to the northwest (represented by R\_17560 at the nearest point), and the village of Sternfield, located approximately 700m to the southwest (represented by R\_17870 at the nearest point).

### Noise Climate

#### Desk study

2.10.7.5 The Suffolk Onshore Scheme noise and vibration study area includes a mix of predominantly residential and rural environments. The noise climate is therefore relatively quiet away from main transport routes.

2.10.7.6 The main existing sources of noise include road traffic from the A12 to the west and, the A1094 which runs between the A12 at Friday Street to the west and Aldeburgh to the east. There are also relatively low levels of traffic on local roads. Away from road traffic sources, ambient sound levels are low and comprise general rural ambient noise, distant road traffic, foliage, and bird song.

2.10.7.7 Defra strategic noise mapping (Ref 2.10.22) indicates that ambient noise levels are moderate to high in the vicinity of the A12 and A1094 but reduce to relatively low levels beyond approximately 300 m from the roads.

- 2.10.7.8 There are no NIA on the existing local public highway along routes which may be used for construction traffic associated with the Suffolk Onshore Scheme. NIAs are determined via strategic noise maps and highlight the residential areas experiencing the highest 1% of noise levels from road and rail sources in England.
- 2.10.7.9 There are however NIAs in the wider area on main transport routes (e.g., The A12 at Farnham and Little Glemham to the southwest) which are not likely to be significantly affected by the Suffolk Onshore Scheme.

### Noise surveys

- 2.10.7.10 A baseline noise survey has been conducted at six locations (S\_L1-6), as shown in **Figure 2.10.1 Suffolk Noise and Vibration Baseline Information**, to inform the assessment of operational noise. Details of the survey are provided in **Volume 2, Part 2, Appendix 2.10.A, Suffolk Noise Survey Data**. A summary of the measured noise levels is provided in Table 2.10.18.

Table 2.10.18: Summary of measured noise levels

Time period	Survey location	Average noise level, dB $L_{Aeq,15min}$	Maximum noise level, dB $L_{Amax,15min}$	Background sound level, dB $L_{A90,15min}$
Day	S_L1	Range: 29 – 65 Average: 45	Range: 42 – 81 Typical: 56	Range: 21 – 52 Average: 34 Mode: 32
	S_L2	Range: 27 – 64 Average: 45	Range: 39 – 95 Typical: 64	Range: 23 – 47 Average: 35 Mode: 38
	S_L3	Range: 29 – 62 Average: 46	Range: 43 – 90 Typical: 55	Range: 22 – 49 Average: 36 Mode: 37
	S_L4	Range: 35 – 59 Average: 47	Range: 48 – 85 Typical: 59	Range: 23 -51 Average: 38 Mode: 38
	S_L5	Range: 27 – 55 Average: 43	Range: 35 – 81 Typical: 52	Range: 22 – 47 Average: 34 Mode: 35
	S_L6	Range: 32 – 61 Average: 46	Range: 40 – 82 Typical: 59	Range: 25 – 48 Average: 36 Mode: 35
Night	S_L1	Range: 19 – 50 Average: 38	Range: 31 – 81 Typical: 58	Range: 17 – 38 Average: 26 Mode: 18
	S_L2	Range: 21 – 67 Average: 49	Range: 33 – 82 Typical: 38	Range: 20 – 42 Average: 26 Mode: 21

<b>Time period</b>	<b>Survey location</b>	<b>Average noise level, dB LAeq,15min</b>	<b>Maximum noise level, dB LAfmax,15min</b>	<b>Background sound level, dB LA90,15min</b>
	S_L3	Range: 19 – 51 Average: 40	Range: 32 – 91 Typical: 41	Range: 16 – 50 Average: 22 Mode: 32
	S_L4	Range: 21 – 58 Average: 45	Range: 34 – 86 Typical: 49	Range: 18 – 41 Average: 27 Mode: 37
	S_L5	Range: 20 – 56 Average: 39	Range: 30 – 71 Typical: 42	Range: 17 – 38 Average: 28 Mode: 18
	S_L6	Range: 24 – 63 Average: 43	Range: 37 -85 Typical: 48	Range: 20 – 41 Average: 31 Mode: 32

2.10.7.11 Table 2.10.19 presents a summary of representative background sound levels during daytime and night-time periods at the survey locations for use in the operational noise assessment.

Table 2.10.19: Summary of representative background sound levels

<b>Monitoring location</b>	<b>Representative background noise level, dB LA90,15min</b>	
	<b>Daytime</b>	<b>Night-time</b>
S_L1	31	20
S_L2	32	22
S_L3	34	22
S_L4	35	23
S_L5	34	22
S_L6	35	25

2.10.7.12 East Suffolk Council have been informed of the proposed representative background sound levels to be used within the assessment of operational noise.

## Vibration Baseline

2.10.7.13 Vibration impacts are assessed against fixed thresholds. It is assumed that existing vibration levels are negligible in the study area.

## Future Baseline

2.10.7.14 No significant changes to the future noise and vibration baseline are anticipated. Should there be any changes, these would be assessed within the ES.

## 2.10.8 Mitigation

2.10.8.1 As set out in **Volume 1, Part 1, Chapter 5, PEIR Approach and Methodology**, mitigation measures typically fall into one of the three categories: embedded measures; control and management measures; and mitigation measures.

### Embedded Measures

2.10.8.2 Embedded measures have been integral in reducing the noise and vibration effects of the Proposed Project. Measures that that have been incorporated are:

- Sensitive routeing and siting of infrastructure and temporary works;
- Commitments made within **Volume 2, Part 1, Appendix 1.4.F, Outline Schedule of Environmental Commitment and Mitigation Measures**;

### Control and Management Measures

2.10.8.3 The following measures have been included within **Volume 2, Part 1, Appendix 1.4.A, Outline Code of Construction Practice** relevant to the control and management of impacts that could affect noise and vibration receptors:

- GG01: The Proposed Project will be run in compliance with all relevant legislation, consents and permits.
- GG03: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP) and a Construction Traffic Management Plan (CTMP) will be produced prior to construction.
- GG04: The CEMP shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake daily site inspections to check conformance to the Management Plans. The name and contact details of person(s) accountable for issues relating to dust, waste, water, noise, vibration and soil will be displayed at site boundary.
- GG05: A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced Environmental Clerk of Works (ECoW) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the CEMP. The ECoW will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The ECoW will be supported, as necessary, by appropriate specialists, including ecologists and arboriculturists.
- GG06: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Proposed Project. Topics will include but not be limited to:
  - pollution prevention and pollution incident response;
  - dust management and control measures;
  - location and protection of sensitive environmental sites and features;
  - adherence to protected environmental areas around sensitive features;



- working hours and noise and vibration reduction measures;
  - working with potentially contaminated materials;
  - waste management and storage;
  - flood risk response actions; and
  - agreed traffic routes, access points, etc.
- GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.
  - GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including cable drums and excavated materials, drop heights will be limited.
  - GG27: Working areas will be appropriately fenced. The type of fencing installed will depend on the area to be fenced and will take into consideration the level of security required in relation to the surrounding land and public access, rural or urban environment and arable or stock farming. For some locations the fence used may also serve to provide acoustic and visual screening of the work sites and reduce the potential for disturbance of users in the surrounding areas. Fencing will be regularly inspected and maintained and removed as part of the demobilisation unless otherwise specified.
  - GG28: Members of the community and local businesses will be kept informed regularly of the works through active community liaison. This will include notification of noisy activities, heavy traffic periods and start and end dates of key phasing. A contact number will be provided which members of the public can use to raise any concerns or complaints about the Proposed Project. All construction-related complaints will be logged by the contractor(s) in a complaints register, together with a record of the responses given and actions taken.
  - NV01: Construction working will be undertaken within the agreed working hours set out within the DCO. Best practicable means to reduce construction noise will be set out within the CEMP.
  - NV02: Construction traffic routes, access tracks, and construction haul routes will be surveyed for damage and irregularities (e.g. potholes) that may lead to vibration from construction traffic. Access tracks and construction haul routes will be well maintained.
  - NV03: Proposed substations and converter stations will be designed such that noise from their normal operation does not cause a significant adverse effect at nearby noise sensitive receptors. Additionally, where feasible the substation and converter station designs will seek to achieve noise levels at nearby noise sensitive receptors in line with the aims the local authorities, or otherwise as low as reasonably possible.
  - TT01: The CTMP will set out measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and

upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set out measures to reduce safety risks through construction vehicle and driver quality standards and measures to manage abnormal loads.

- TT02: The contractor(s) will implement a monitoring and reporting system to check compliance with the measures set out within the CTMP. This will include the need for a GPS tracking system to be fitted to Heavy Goods Vehicles (HGV) to check for compliance with authorised construction routes. The contractor(s) will also be expected to monitor the number of construction vehicles between the site and the strategic road network. Deviations from the authorised routes or changes to traffic levels that are higher than the CTMP assumptions will require discussion of the need for additional mitigation measures with relevant highways authorities.

## Mitigation Measures

2.10.8.4 Mitigation measures are additional topic and site-specific measures that have been applied to mitigate or offset any likely significant effects. Mitigation measures included that are relevant to noise and vibration receptors are:

- Application of BPM (e.g. screening) to reduce levels of noise and vibration from potentially significant construction activities; and
- Saxmundham Converter Station will include appropriate noise mitigation measures in the design (e.g. plant selection, and transformer noise enclosures).

## 2.10.9 Preliminary Assessment of Effects

2.10.9.1 The preliminary assessment of the effects of the Suffolk Onshore Scheme described in this section considers the embedded, control and management and mitigation measures described in Section 2.10.8.

2.10.9.2 The preliminary noise and vibration assessment of the effects of the Suffolk Onshore Scheme is presented in the following tables.

## Preliminary Assessment of Construction Noise Effects

2.10.9.3 Table 2.10.20 presents the preliminary assessment of construction noise. The assessment is based on the information contained in **Volume 2, Part 1, Appendix 1.4.A, Construction Plant Schedule** and **Volume 2, Part 2, Appendix 2.10.B, Suffolk Construction Noise and Vibration Data**. Results are also shown graphically in **Figure 2.10.2 Suffolk Initial Construction Noise and Vibration Assessment**.

Table 2.10.20: Preliminary assessment of construction noise

	<b>Preliminary assessment</b>
Receptors	Noise sensitive receptors within the construction noise study area as shown in <b>Figure 2.10.1 Suffolk Noise and Vibration Baseline Information</b> .
Potential Impact	Potential noise impacts from construction activities.
Proposed Project phase	Construction.

<b>Preliminary assessment</b>	
Duration	Temporary short to medium term.
Mitigation	GG01, GG03, GG04, GG05, GG06, GG11, GG14, GG25, GG26, NV01.
<b>Proposed Project</b>	
Preliminary sensitivity	Residential – Sensitivity factored into assessment. Health Care – High sensitivity. Equestrian facility – Medium sensitivity.
Preliminary magnitude	<p>Without mitigation, there are potential medium to large magnitude impacts from construction activities within approximately 126 m of residential NSR and within approximately 300 m of high sensitivity NSR. The assessment assumes that no specific mitigation measures are in place in order to highlight noise ‘hot-spots’.</p> <p>Potential medium or large magnitude impacts are likely at 51 NSR, as shown in <b>Figure 2.10.2 Suffolk Initial Construction Noise and Vibration Assessment – Proposed Project</b>. This includes 49 residential NSR, and two equestrian facilities (A_76 and A_80). A small magnitude impact is expected at one healthcare facility (H_35).</p> <p>There is potential medium to large magnitude effects at eleven residential NSR due to construction of the proposed Saxmundham Converter Station, assuming the construction at the LoD boundary. If built at the proposed location shown in <b>Figure 1.4.2 Saxmundham Converter Station Indicative Location</b>, impacts would be, at worst, small magnitude at all NSR.</p> <p>There are potential medium or large magnitude impacts at 19 residential NSR and a small impact at one healthcare facility (H_35) due to the construction of the proposed haul road and compound to the northeast of Saxmundham.</p> <p>There are potential medium or high magnitude impacts at two residential NSR due to the construction of the proposed permanent access and associated bell mouth (BM13) off the B1121 to the east of Sternfield.</p> <p>There are potential medium or large magnitude impacts at the remaining 17 residential NSR and two equestrian facilities (A_76 and A_80, noting that these are at the same location) due to proposed cable construction.</p> <p>Impacts from all other construction activities would be, at worst, small magnitude at all other NSR.</p> <p>Where BPM, such as localised screening, are in place, construction noise impacts would be negligible to small magnitude at all NSR.</p>

<b>Preliminary assessment</b>	
	<p><u>Consideration of LoD</u></p> <p>The assessment considers works could occur at the extent of the LoD boundary as a worst-case.</p>
Preliminary likely significance of effect	With mitigation, effects are likely <b>Not Significant</b> at all NSR.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	Medium to high.
<b>Proposed Project with co-location</b>	
Preliminary sensitivity	No change from that reported for the Proposed Project only.
Preliminary magnitude	The potential co-location works would occur within the LoD for the Proposed Project. The assessment for the Proposed Project considered works may occur at the extent of the LoD boundary as a worst-case. Therefore effects of construction noise from the co-location scenario are as per those for the Proposed Project, as detailed above, as shown in <b>Figure 2.10.3 Suffolk Initial Construction Noise and Vibration Assessment – Proposed Project Plus Co-location.</b>
Preliminary likely significance of effect	No difference in significance of effects to those reported for the Proposed Project.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	Medium to high

## Preliminary Assessment of Construction Vibration Effects

- 2.10.9.4 Table 2.10.21 provides the preliminary assessment of construction vibration. The assessment is based on the information contained in **Volume 2, Part 1, Appendix 1.4.A, Construction Plant Schedule** and **Volume 2, Part 2, Appendix 2.10.B, Suffolk Construction Noise and Vibration Data**. Results are also shown graphically in **Figure 2.10.2 Suffolk Initial Construction Noise and Vibration Assessment**.

Table 2.10.21: Preliminary assessment of construction vibration

<b>Preliminary assessment</b>	
Receptors	Noise sensitive receptors within the construction noise study area as shown in <b>Figure 2.10.1 Suffolk Noise and Vibration Baseline Information.</b>
Potential Impact	Potential vibration impacts from construction activities.
Proposed Project phase	Construction.

<b>Preliminary assessment</b>	
Duration	Short duration. Expected to be less than one day.
Mitigation	GG01, GG03, GG04, GG05, GG06, GG11, GG26, NV01.
<b>Proposed Project</b>	
Preliminary sensitivity	Residential – Sensitivity factored into assessment criteria.
Preliminary magnitude	<p>There is potential medium to large magnitude impact during ground compaction activities if conducted within approximately 18 m of the NSR. This would include three residential NSR (R_100, R_113, and R_18540), as shown in <b>Figure 2.10.2 Suffolk Initial Construction Noise and Vibration Assessment</b>.</p> <p>There are potential medium or large magnitude impacts at two residential NSR (R_100 and R_113) due to the construction of the proposed haul road to the northeast of Saxmundham.</p> <p>There are potential medium or large magnitude impacts at one residential NSR (R_18540) due to the construction of the proposed bell mouths (BM01 and BM02) of Leiston Road to the north of Aldeburgh.</p> <p>However, the duration of such activities is likely to be relatively short (likely less than a day) and below the temporal threshold significance.</p> <p>Impacts from all other activities, including any piling, and compaction activities associated with cable construction, compounds, substation and converter station construction, pylons and landfall would be, at worst, small magnitude.</p> <p><u>Consideration of LoD</u></p> <p>The assessment considers works could occur at the extent of the LoD boundary as a worst-case.</p>
Preliminary likely significance of effect	With mitigation, effects are likely <b>Not Significant</b> at all NSR.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	Medium to high.
<b>Proposed Project with co-location</b>	
Preliminary sensitivity	No change from that reported for the Proposed Project only.
Preliminary magnitude	The potential co-location works would occur within the LoD for the Proposed Project. The assessment for the



<b>Preliminary assessment</b>	
	Proposed Project considered works may occur at the extent of the LoD boundary as a worst-case. Therefore, effects of construction vibration from the co-location scenario are as per those for the Proposed Project, as detailed above, as shown in <b>Figure 2.10.3 Suffolk Initial Construction Noise and Vibration Assessment – Proposed Project Plus Co-location.</b>
Preliminary likely significance of effect	No difference in significance of effects to those reported for the Proposed Project.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	Medium to high.

## Preliminary Assessment of Construction Traffic Noise Effects

2.10.9.5 Table 2.10.22 provides the preliminary assessment of construction traffic noise. The assessment is detailed in **Volume 2, Part 2, Appendix 2.10.B, Suffolk Construction Noise and Vibration Data.**

Table 2.10.22: Preliminary assessment of construction traffic noise

<b>Preliminary assessment</b>	
Receptor	NSR close to proposed transport routes on the public highway.
Potential Impact	Potential impact due to increased road traffic noise due to the additional contribution from construction traffic on the public highway.
Proposed Project phase	Construction.
Duration	Temporary short to medium term.
Mitigation	GG01, GG03, GG04, GG05, GG06, GG26, NV01, NV02, TT01, TT02.
<b>Proposed Project</b>	
Preliminary sensitivity	Within 50 m of affected routes there are residential NSR and low to medium sensitivity non-residential receptors.
Preliminary magnitude	There is a small magnitude impact on five assessed routes; namely: <ul style="list-style-type: none"> <li>• The B1121 Main Road (two assessment sections between the A12 and B1119 to the south of Saxmundham);</li> <li>• The B1121 (between B1121 Main Road and A1094 Junctions to the southeast of Saxmundham via Sternfield and Friston);</li> </ul>

<b>Preliminary assessment</b>	
	<ul style="list-style-type: none"> <li>The A1094 (between the A12 and B1069 Junctions to the south of Sternfield and Friston, via Friday Street, Snape Watering, and Church Common); and</li> <li>The B1069 Snape Road (between the A1094 and B1353 Junctions to the south of Lieston, via Knodshall Common)</li> </ul> <p>The impact of all other routes is negligible magnitude.</p>
Preliminary likely significance of effect	Likely <b>Not Significant</b> at all NSR.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	Medium to high.
<b>Proposed Project with co-location</b>	
Preliminary sensitivity	No change from that reported for the Proposed Project only.
Preliminary magnitude	The construction traffic data used to inform the construction traffic noise assessment for the Proposed Project takes account of co-location as a worst-case scenario. Therefore the magnitude of impact for co-location is as reported above for the Proposed Project.
Preliminary likely significance of effect	No difference in significance of effects to those reported for the Proposed Project.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	Medium to high.

## Preliminary Assessment of Construction Traffic Vibration Effects

2.10.9.6 Table 2.10.23 provides the preliminary assessment of construction traffic vibration. The assessment is detailed in **Volume 2, Part 2, Appendix 2.10.B, Suffolk Construction Noise and Vibration Data**.

Table 2.10.23: Preliminary assessment of construction traffic vibration

<b>Preliminary assessment</b>	
Receptors	Vibration sensitive receptors close to proposed transport routes (public highway, access tracks, and haul roads).
Potential Impact	Potential vibration impact from construction traffic on the public highway, access tracks on haul roads.
Proposed Project phase	Construction.
Duration	Short to medium term.

<b>Preliminary assessment</b>	
Mitigation	GG01, GG03, GG04, GG05, GG06, GG11, GG14, GG26, NV01, NV02, TT01, TT02.
<b>Proposed Project</b>	
Preliminary sensitivity	Residential – Sensitivity factored into assessment criteria; and Medium to high sensitivity non-residential NSR.
Preliminary magnitude	Where the public highway, access tracks, and haul roads are well maintained, the magnitude of impact will be negligible to small.
Preliminary likely significance of effect	Likely <b>Not Significant</b> at all NSR.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	High.
<b>Proposed Project with co-location</b>	
Preliminary sensitivity	No change from that reported for the Proposed Project only.
Preliminary magnitude	Where the public highway, access tracks, and haul roads are well maintained, the magnitude of impact will be negligible to small.
Preliminary likely significance of effect	No difference in significance of effects to those reported for the Proposed Project.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	High.

## Preliminary Assessment of Operational Noise Effects

2.10.9.7 Table 2.10.24 provides the preliminary assessment of operational noise from the proposed converter station. The assessment is detailed in **Volume 2, Part 2, Appendix 2.10.C, Suffolk Preliminary Operational Noise Assessment**.

Table 2.10.24: Preliminary assessment of operational noise

<b>Preliminary assessment</b>	
Receptor	Noise sensitive receptors within the operational noise study area as shown in <b>Figure 2.10.1 Suffolk Noise and Vibration Baseline Information</b> .
Potential Impact	Potential impact of operational noise from the proposed Saxmundham Converter Station.
Proposed Project phase	Operation.

<b>Preliminary assessment</b>	
Duration	Permanent long term.
Mitigation	NV03 Saxmundham Converter Station will include appropriate noise mitigation measures in the design (e.g. plant selection, and transformer noise enclosures)
<b>Proposed Project</b>	
Preliminary sensitivity	Residential – Sensitivity factored into assessment.
Preliminary magnitude	<p>Assuming built at proposed location shown in <b>Figure 1.4.2 Saxmundham Converter Station Indicative Location</b>.</p> <p>The main sources of noise from the proposed Saxmundham Converter Station are transformers, with other plant items being secondary. Provided mitigation measures are incorporated in the design, following the mitigation hierarchy, the impact of operational noise from the proposed converter station would be negligible to small magnitude at all nearby NSR.</p> <p><u>Consideration of LoD</u></p> <p>All else being equal, noise levels would be higher if built closer to NSR and lower if built further from NSR. Noise levels would typically increase or reduce by approximately 6 dB for every halving or doubling of distance, respectively.</p> <p>Changing the location within in LoD therefore has the potential to affect the outcome of the assessment. However, the design of the proposed converter station would also alter, in terms of the proposed noise mitigation measures, to reflect those changes.</p> <p>Additionally, potential noise impacts would act as a constraint within the LoD such that movement to within distances which would lead to adverse or significant adverse effect would be avoided, where practicable.</p> <p>The overall outcome therefore would not be expected to change due to movement within the LoD provided appropriate noise mitigation measures are considered in the design.</p>
Preliminary likely significance of effect	Likely <b>Not Significant</b> at all NSR.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	Medium to high.
<b>Proposed Project with co-location</b>	

<b>Preliminary assessment</b>	
Preliminary sensitivity	No change from that reported for the Proposed Project only.
Preliminary magnitude	Similar to the consideration of movement within the LoD, the effects of operational noise from the co-location scenario would factor into the final design of the converter stations, in terms of the proposed noise mitigation measures. Similar to mitigation proposed for the Saxmundham Converter Station (NV03), it is anticipated that the design of the other two converter stations would include noise mitigation measures such that the cumulative effect of all sites operating simultaneously would not result in a significant adverse effect at nearby NSR. Additionally, where feasible, the converter station(s) designs will seek to achieve noise levels at nearby noise sensitive receptors in line with the aims the local authorities, or otherwise as low as reasonable practicable.
Preliminary likely significance of effect	No difference in significance of effects to those reported for the Proposed Project.
Sensitivity Test	The assessment outcome would not be expected to be affected by altering the start dates of the works.
Confidence in prediction	Medium.

## 2.10.10 Summary

2.10.10.1 Table 2.10.25 provides the preliminary assessment of noise and vibration.

Table 2.10.25: Summary of preliminary effects of noise and vibration

<b>Source</b>	<b>Receptor</b>	<b>Sensitivity</b>	<b>Magnitude</b>	<b>Significance of effect</b>
Construction noise (Proposed Project)	NSR	Residential, and medium to high non-residential NSR	Negligible to small	<b>Not Significant</b>
Construction noise (Proposed Project with co-location)	NSR	Residential, and medium to high non-residential NSR	Negligible to small	<b>Not Significant</b>
Construction vibration (Proposed Project)	NSR	Residential, and medium to high non-residential NSR	Negligible to small	<b>Not Significant</b>



<b>Source</b>	<b>Receptor</b>	<b>Sensitivity</b>	<b>Magnitude</b>	<b>Significance of effect</b>
Construction vibration (Proposed Project with co-location)	NSR	Residential, and medium to high non-residential NSR	Negligible to small	<b>Not Significant</b>
Construction traffic noise (Proposed Project and Proposed Project with co-location)	NSR	Residential, and low to medium non-residential NSR	Negligible to small	<b>Not Significant</b>
Construction traffic vibration (Proposed Project and Proposed Project with co-location)	NSR	Residential, and medium to high non-residential NSR	Negligible to small	<b>Not Significant</b>
Operational noise (Proposed Project)	NSR	Residential, and medium to high non-residential NSR	Negligible to small	<b>Not Significant</b>
Operational noise (Proposed Project with co-location)	NSR	Residential, and medium to high non-residential NSR	Negligible to small	<b>Not Significant</b>

## 2.10.11 References

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