

The Lighthouse Green Fuels Order

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Abbreviations

Abbreviation	In full
ABC Method	A method of determining significance of construction noise from BS 5228-1:2009+A1:2014 by setting an appropriate "Assessment category" (A, B or C) that is derived from existing ambient noise levels. If the construction site noise level exceeds the appropriate category value, a potential significant effect is indicated.
BAT	Best Available Techniques
BNL	Basic Noise Level
BPM	Best Practicable Means
CEMP	Construction Environmental Management Plan
CHP	Combined Heat and Power
CNVMP	Construction Noise and Vibration Management Plan
CoPA	Control of Pollution Act 1974
dB(A)	The unit used to define a weighted sound pressure level, which correlates well with the subjective response to sound. The 'A' weighting follows the frequency response of the human ear, which is less sensitive to low and very high frequencies than it is to those in the range 500Hz to 4kHz. In some statistical descriptors the 'A' weighting forms part of a subscript, such as L_{A10} , L_{A90} , and L_{Aeq} for the 'A' weighted equivalent continuous noise level.
DCO	Development Consent Order
Decibel (dB)	The ratio of sound pressures which people can hear is a ratio of $10^6:1$ (one million: one). For convenience, therefore, a logarithmic measurement scale is used. The resulting parameter is called the 'sound pressure level' (L) and the associated measurement unit is the decibel (dB). As the decibel is a logarithmic ratio, the laws of logarithmic addition and subtraction apply.
DMRB	Design Manual for Roads and Bridges
EA	Environment Agency
EIA	Environmental Impact Assessment
ES	Environmental Statement
fCEMP	Framework Construction Environmental Management Plan. The fCEMP sets out the key measures to be employed during construction to control and minimise the construction impacts on the environment
FEED	Front-End Engineering Design
Frequency	Frequency is the rate of repetition of a sound wave. The subjective equivalent in music is pitch. The unit of frequency is the hertz (Hz). 1000Hz is often denoted as 1kHz, e.g. 2kHz =

Abbreviation	In full
	2000Hz. Human hearing ranges approximately from 20Hz to 20kHz. For design purposes, the octave bands between 63Hz and 8kHz are generally used. The most commonly used frequency bands are octave bands, in which the mid frequency of each band is twice that of the band below it. For more detailed analysis, each octave band may be split into three one-third octave bands or narrow frequency bands.
HBC	Hartlepool Borough Council
HGV	Heavy Goods Vehicle
Hz	Hertz, the unit of frequency, which is identical to cycles per second.
LOAEL	Lowest Observed Adverse Effect Level
Maximum noise level	The maximum noise level identified during a measurement period. Experimental data has shown that the human ear does not generally register the full loudness of transient sound events of less than 125ms duration and fast time weighting (F) has an exponential time constant of 125ms which reflects the ear's response. Slow time weighting (S) has an exponential time constant of 1s and is used to allow more accurate estimation of the average sound level on a visual display. The maximum level measured with fast time weighting is denoted as $L_{Amax, F}$. The maximum level measured with slow time weighting is denoted $L_{Amax, S}$.
MMO	Marine Management Organisation
NE	Natural England
NPPF	National Planning Policy Framework
NPSE	Noise Policy Statement for England
NSR	Noise sensitive receptor(s). Noise (and vibration) sensitive receptors include residential properties, sensitive commercial and community uses (such as offices, educational premises, medical facilities, places of worship) and public open spaces, including public rights of way (PRoW), and sensitive ecological receptors.
PEIR	Preliminary Environmental Information Report
PINS	Planning Inspectorate
RCBC	Redcar and Cleveland Borough Council
SAF	Sustainable Aviation Fuel
SRI	Sound Reduction Index
STBC	Stockton-on-Tees Borough Council
SOAEL	Significant Observed Adverse Effect Level
Sound pressure level (SPL)	The sound power emitted by a source results in pressure fluctuations in the air, which are heard as sound. The sound pressure level (L) is ten times the logarithm of the ratio of the measured sound pressure (detected by a

Abbreviation	In full
	microphone) to the reference level of 2×10^{-5}Pa (the threshold of hearing). Thus $L \text{ (dB)} = 10 \log (P_1/P_{\text{ref}})^2$ where P_{ref}, the lowest pressure detectable by the ear, is 0.00002 pascals (i.e. 2×10^{-5} Pa). The threshold of hearing is 0dB, while the threshold of pain is approximately 120dB. Normal speech is approximately 60dBL_A and a change of 3dB is only just detectable. A change of 10dB is subjectively twice, or half, as loud.
Statistical noise levels	For levels of noise that vary widely with time, for example road traffic noise, it is necessary to employ an index which allows for this variation. L_{p10}, the level exceeded for 10% of the time period under consideration and can be used for the assessment of road traffic noise (note that L_{pAeq} is used in BS 8233 for assessing traffic noise). The L_{90}, the level exceeded for 90% of the time, has been adopted to represent the background noise level. The L_1, the level exceeded for 1% of the time, is representative of the maximum levels recorded during the sample period. A-weighted statistical noise levels are denoted L_{A10}, dBL_{A90}. The reference time period (T) is normally included, e.g. dBL_{A10, 5min} or dBL_{A90, 8hr}.
WHO	World Health Organization

9 Noise and Vibration

9.1 Introduction

Overview

- 9.1.1 This chapter of the Environmental Statement (ES) presents the assessment of likely significant effects of noise and vibration arising from construction, operation and decommissioning of the Proposed Development.
- 9.1.2 This chapter sets out the relevant legislation, policy, standards and guidance applied to the assessment process; consultation undertaken to inform the assessment; assessment methodology; the relevant baseline conditions upon which the assessment is based; embedded mitigation considered in place before the assessment is undertaken; the likely significant effects that may arise as a result of the Proposed Development considering embedded mitigation; further mitigation proposals to reduce or remove identified likely significant effects wherever possible; likely remaining residual effects following further mitigation; and any monitoring proposals.
- 9.1.3 The cumulative effects of noise and vibration associated with the Proposed Development and other committed developments in the vicinity are described in Section 9.9.
- 9.1.4 Understanding cumulative effects between topics is an integral part of the Environmental Impact Assessment (EIA) process and forms part of the ES, which will accompany the Development Consent Order (DCO) application. The following chapters are referenced in this chapter:
- **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1);**
 - **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1); and**
 - **Chapter 22: Cumulative and Combined Effects (ES Volume I, Application Document Ref. 6.1).**
- 9.1.5 This chapter assesses the impacts of noise and vibration on sensitive human receptors (hereafter referred to as noise sensitive receptors (NSRs)). The assessment of noise and vibration impacts on relevant ecological receptors is presented in **Chapter 10: Terrestrial Ecology** and **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1).**
- 9.1.6 This chapter is supported by the following figures (**ES Volume II, Application Document Ref. 6.2**):

- **Figure 9.1 Operational noise study area;**
- **Figure 9.2 Construction noise study area;**
- **Figure 9.3 Baseline sound survey locations used for the Proposed Development;**
- **Figure 9.4 Locations of noise sensitive receptors (NSRs);**
- **Figure 9.5 Operational noise contour map for NSRs;**
- **Figure 10.5 Locations of ecological receptors; and**
- **Figure 10.6 Assessment results for terrestrial ecological receptors.**

9.1.7 This chapter is also supported by **Appendix 9A: Baseline noise monitoring report (ES Volume III, Application Document Ref. 6.3).**

[Scope of the assessment](#)

9.1.8 **Appendix 1A: EIA Scoping Report (ES Volume III, Application Document Ref. 6.3)** sets out the proposed scope for the assessment of noise and vibration. The scope of the noise and vibration assessments in the ES is summarised in Table 9.1. Table 9.1 also outlines what has been agreed to be scoped in and out with the Planning Inspectorate.

Table 9.1 Scope of noise and vibration assessments

Aspect	Phase	Scoped in / out	Summary comment
Baseline sound survey	N/A	Scoped in	Surveys have been undertaken to establish typical background sound levels at residential NSRs and ecological receptors.
Noise impacts	Construction and decommissioning	Scoped in	The potential noise impacts on residential NSRs have been assessed within the specified 300m Study Area of the Proposed Development for construction noise. See Paragraph 9.1.9 regarding residential NSRs outside the Study Area. The construction noise assessment for ecological receptors is reported in Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1).
Vibration impacts	Construction and decommissioning	Scoped out	Residential NSRs are all outside the 100m Study Area of the Proposed Development for construction vibration.

Aspect	Phase	Scoped in / out	Summary comment
			In addition, no vibration-sensitive, non-residential NSRs have been identified within a 200m Study Area of the Proposed Development as part of the EIA or consultation process. Therefore, vibration impacts during the construction and decommissioning phases have been scoped out.
Noise impacts	Operation	Scoped in	Sources of operational noise from the Main Site and ship movements and associated unloading activities are anticipated to be located more than 1km from the nearest residential NSRs. At these NSRs, it is anticipated that the baseline sound environment will be dominated by other sources such as local road traffic. However, due to the possibility of low frequency noise impacts, and to establish noise limits at NSRs, operational noise is scoped in.
Vibration impacts	Operation	Scoped out	Transmission of operational vibration into the ground would be controlled through plant design and isolation where required. In addition, due to the large distances between vibration sources and residential NSRs, vibration from the operation of the Main Site and ship unloading operations at the quay are unlikely to lead to a significant effect.
Road traffic noise impacts	Construction and decommissioning	Scoped in	Construction and operational traffic routes to and from the Proposed Development are expected to be in the vicinity of residential NSRs, so construction and operational traffic noise is scoped in.
	Operation		
Road traffic vibration impacts	Construction and decommissioning	Scoped out	The vibration generated by construction and operational traffic vehicles would be similar to the vibration caused by any other similar vehicles that could legally use the routes. It is, therefore, anticipated that significant effects are unlikely to occur.
	Operation		

Aspect	Phase	Scoped in / out	Summary comment
Marine traffic noise impacts	Construction, operation and decommissioning	Scoped out	It is anticipated that changes to marine traffic flows due to marine activities on the River Tees, compared to baseline traffic, will be minimal, so significant effects are unlikely.
Underwater noise impacts	Construction	Scoped in	Demolition of existing infrastructure and construction works would be required for the construction of a new quay. The impact of underwater noise on ecology is therefore scoped in and is reported in Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1) .
	Operation	Scoped out	Existing marine traffic movements on the River Tees are high, at approximately 270 per week in 2025 according to the Preliminary Navigation Risk Assessment. Proposed additional marine traffic associated with operations of the Proposed Development will cause minimal changes to existing underwater noise levels, so significant effects are unlikely.
	Decommissioning	Scoped out	The quay will not be demolished and will be retained for future use.

Study Area

- 9.1.9 For construction noise, a Study Area for residential receptors of 300m from the Proposed Development has been adopted, including activities associated with the development of the connection corridors within the Wider Site. This is the distance beyond which BS 5228-1:2009+A1:2014 [Ref 1] states that noise predictions should 'be treated with caution'. It is considered sufficient to ensure that all potentially significant noise effects will be identified and addressed. The residential NSRs nearest to the Main Site in each direction (Port Clarence to the southwest; Cowpen Bewley to the west; Marsh House Lane to the north; and South Bank to the south) are all more than 1km from the Proposed Development and outside of the Study Area (see distances in Table 9.8) and therefore significant effects due to construction noise are not expected at these NSRs. Construction traffic noise has been assessed at the residential NSR in Dormanstown, as it is less than 300m away from a vehicular (including Heavy Goods Vehicles (HGVs)) access route within the Proposed Development. The traffic flows on this access route are low.

- 9.1.10 For operational noise from fixed plant and equipment, a Study Area has been adopted of 1km around the Main Site (to which stationary operational plant is assumed to be limited), or the area within which noise levels from the Proposed Development are forecast to give rise to potential impacts, whichever is the greater. This is considered sufficient to ensure that all potentially significant noise effects, including low frequency sound, will be identified and addressed based on precedents set in other projects.
- 9.1.11 The Study Areas for construction and operational noise are presented in **Figure 9.1: Operational Noise Study Area** and **Figure 9.2: Construction Noise Study Area (ES Volume II, Application Document Ref. 6.2)**.
- 9.1.12 The assessments of construction and operational noise on terrestrial ecological receptors are outlined in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1)**. The locations of terrestrial ecological receptors assessed are presented in **Figure 10.5 (ES Volume II, Application Document Ref. 6.2)**.
- 9.1.13 The underwater construction noise Zone of Influence on marine ecological receptors are outlined in **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**.

Direct impacts

- 9.1.14 Direct impacts during construction could arise from noise and vibration caused by fixed and mobile plant operating on the Proposed Development, including HGV access routes. Furthermore, direct impacts could arise from construction vehicles using the public highway in the vicinity of the works. These impacts are outlined in Section 9.6.
- 9.1.15 Direct impacts from operational noise could be caused by plant and machinery that would operate on the Proposed Development, including fixed plant and vehicles. The assumed operational noise levels of these sources have been modelled and are listed in Section 9.5, and the impacts are outlined in Section 9.6.

Indirect impacts

- 9.1.16 Indirect impacts of road traffic noise are those arising at greater distances from the direct impact Study Area. Indirect impacts result from changes in traffic flows on existing roads that are subject to a traffic noise change of more than 1dB(A).
- 9.1.17 For construction traffic noise, a 50m Study Area from public roads with an expected increase in baseline noise level of 1 dB(A) or more (due to the additional construction traffic) has been adopted. This is in line with the guidance in Design Manual for Roads and Bridges (DMRB) LA 111 (2020)

[Ref 2] which does not require the assessment of effects at receptors more than 50m from works.

- 9.1.18 The Study Area for assessing indirect operational road traffic noise impacts extends along all affected roads within the surrounding network which are outlined in **Chapter 18: Traffic and Transport (ES Volume I, Application Document Ref. 6.1)**. In accordance with DMRB LA 111 (2020) [Ref 2], a 50m Study Area from existing public roads with an expected short-term increase in baseline noise level of 1 dB(A) or more (due to the Proposed Development) has been adopted. More detail can be found in Section 9.6.

9.2 Legislation and planning policy context

Overview

- 9.2.1 The following section identifies the relevant legislation, planning policy, standards and guidance which underpin the assessment methodology for noise and vibration and have informed the assessment, including the identification of mitigation. Further details on planning policies can be found in **Chapter 7: Planning and Energy Policy (ES Volume I, Application Document Ref. 6.1)**.

Legislation

Table 9.2 Noise and vibration legislation

Legislation	Relevance to assessment
Control of Pollution Act 1974, Part III Noise [Ref 3]	Relevant for the assessment and mitigation of construction and operational noise and vibration. Section 60 allows local authorities to regulate noise from construction sites by serving notices specifying requirements on how the works should be carried out; Section 61 allows individuals intending to carry out construction works to apply for prior consent from the local authority, detailing the works and noise mitigation measures, with the authority having the power to attach conditions and Applicants having the right to appeal decisions; Section 71 defines the Secretary of State's authority to issue or approve codes of practice for minimising noise, including the use of specific types of equipment. These codes can be prepared by the Secretary of State or approved if issued by others. Additionally, the Secretary of State must approve a code of practice for works covered by section 60 of the Act. Section 72 defines "best practicable means" as methods that are reasonably practicable considering local conditions, technical knowledge and financial implications, and includes design, installation, and maintenance of plant, machinery, buildings, and acoustic structures, while

Legislation	Relevance to assessment
	ensuring compatibility with legal duties, safety, and emergency circumstances.
The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 [Ref 4]	Section 71 of the Control of Pollution Act 1974 allows the Secretary of State to approve codes of practice for minimising noise, including vibration, on construction and open sites. The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015, effective from 6 April 2015, approves parts 1 and 2 of BS 5228 as a statutory code of practice.
Environmental Protection Act 1990 [Ref 5]	Relevant for the assessment of construction and operation noise and vibration. Section 79 states that statutory nuisance includes noise (including vibration) emitted from premises so as to be prejudicial to health or a nuisance. Section 79 also defines best practicable means (BPM) which will be required for construction activities.
The Environmental Permitting (England and Wales) Regulations 2016 [Ref 30]	The Environmental Permitting regulatory regime is designed to address industrial pollution. Environmental permits require operators to control pollution including noise and vibration.

Policy

Table 9.3 Noise and vibration policy

EN-1 Overarching National Policy Statement for Energy (NPS EN-1) (UK Gov, 2025) [Ref 8]	Sets out the overarching policy for the delivery of major energy infrastructure projects, including the general principles for assessing their impacts due to noise and vibration. References the Noise Policy Statement objectives to promote good health and good quality of life through effective noise management, and a requirement to consider adverse impacts on wildlife and biodiversity including in the marine environment. Paragraph 5.12.2 acknowledges that similar considerations apply to vibration and confirms that references throughout the NPS to noise apply equally to the assessment of impacts of vibration. Mitigation should demonstrate good design and may include engineering, layout, administrative and insulation measures. Detail on the Applicant's compliance with key paragraphs from the NPS in relation to noise and vibration are set out at Table 9.4 below.
EN-3 National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (UK Gov, 2025) [Ref 9]	Sets out decision making framework related to renewable energy generation including energy from biomass and waste. Requires Applicants to provide information on impacts and mitigation for noise from delivery of fuel and materials, processing of waste, turbines and all related plant such as condensers. Refers to NPS EN-1 regarding objectives, assessment and provision of mitigation.

National Planning Policy Framework (NPPF) (Ministry of Housing, Communities & Local Government, 2026) [Ref 6]	P1 1b Planning for clean and safe spaces P3 2a, 2b, 3d Living conditions and pollution Relevant for the assessment of construction and operational noise and vibration, as well as mitigation measures to minimise potential adverse impacts. Planning policies and decisions should ensure that new development avoids contributing to unacceptable levels of noise pollution. Proposals should be appropriate for their location, taking into account the likely effects of noise on human health, living conditions, and the natural environment including any cumulative impacts. Applicants are expected to mitigate and reduce adverse noise impacts to a minimum and avoid significant adverse effects on health and quality of life. Consideration should be given to protecting tranquil areas that are relatively undisturbed by noise and valued for their amenity and recreational use.
Noise Policy Statement for England (NPSE) (UK Gov, 2010) [Ref 7]	Applicants must demonstrate that their proposed developments will: • avoid significant adverse effects on health and quality of life; • mitigate and minimise adverse effects on health and quality of life; and • where possible, contribute to the improvement of health and quality of life. These objectives align with the overarching policy vision of the NPSE, and proposals should reference and comply with this framework in line with planning guidance.
Stockton-on-Tees Borough Council (STBC) Local Plan (2019) [Ref 10]	The Stockton-on-Tees Borough Council Local Plan adopted in January 2019 states: • To ensure the conservation and enhancement of the environment alongside meeting the challenge of climate change the Council will be preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of ground, air, water, light or noise pollution or land instability. (Policy SD5 – 1.L) • The Tees Lowlands National Character Area description, and the Stockton-on-Tees Landscape Character Assessment and Capacity Study (2011) provide the evidence base to consider proposals in landscape terms. The NPPF supports the protection and enhancement of valued landscapes and areas of tranquillity; countryside, limits to development and green wedge policies assist in delivering this aim. Proposals within and adjacent to these designations should be designed to avoid impacts on areas within that have remained relatively undisturbed by noise and are prized for their recreational and amenity value. (Paragraph 4.53) • Development should provide an acceptable level of amenity for future users and be of a scale and type that is

	in keeping with its surroundings. It should not adversely affect the amenity of the occupiers of neighbouring properties, through for example, loss of privacy, overshadowing, vibration, or pollution (including light, noise, fumes and waste). (Paragraph 4.73) All development proposals that may cause groundwater, surface water, air (including odour), noise or light pollution either individually or cumulatively will be required to incorporate measures as appropriate to prevent or reduce their pollution so as not to cause unacceptable impacts on the living conditions of all existing and potential future occupants of land and buildings, the character and appearance of the surrounding area and the environment. (Policy ENV7 – Ground, Air, Water, Noise and Light Pollution – 1.)
Redcar and Cleveland Borough Council (RCBC) Local Plan (2018) [Ref 11]	The Redcar and Cleveland Borough Council Local Plan adopted in May 2018 states: - The Council will ensure that new development will not result in unacceptable impacts on those living or working nearby, particularly by way of loss of privacy and the effects of light, noise, odours, pollution or other disturbances. (Paragraph 2.26) - All development must be designed to a high standard. Development proposals will be expected to minimise pollution including light and noise and vibration levels to meet or exceed acceptable limits. (Policy SD4) - Renewable energy developments will not be allowed within, or where they are likely to have an adverse effect - alone, or in combination with other plans or projects - on designated ecological sites or on priority species, unless they meet the exceptions criteria set out in Policy N4. (Policy SD6)
Hartlepool Borough Council (HBC) Local Plan (2018) [Ref 12]	With regard to Low Carbon Energy Generation developments, HBC Local Policy (CC3) states that applications will be approved subject to proposals satisfactorily addressing noise impacts on the amenity of local residents and nearby occupiers, including cumulative impacts within and outside the Borough. Proposals should include details of associated developments, including access roads, transmission lines, and ancillary buildings. Proposals should also include details of measures to mitigate any adverse effects on the amenities of occupiers of nearby properties during the construction, operational lifespan, and decommissioning of equipment and/or infrastructure.

9.2.2 Table 9.4 lists the paragraphs from the NPS that are relevant to the noise and vibration assessment and sets out where these policy requirements are addressed within this chapter.

Table 9.4 Compliance with key paragraphs from the NPS in relation to noise and vibration

Relevant paragraph reference	Summary of relevant NPS paragraph	Where addressed in
EN-1 Overarching National Policy Statement for Energy (NPS EN-1) (UK Gov, 2025) [Ref 8]		
4.12.1-4.12.8 Pollution Control and Other Environmental Regulatory Regimes	Applicants should assess and address emissions and discharges from their projects, including noise and vibration, which may fall under separate regimes such as pollution control or local planning. They are required to consult relevant regulators early and, where possible, submit permit and licence applications alongside their development consent application. Compliance with Environmental Permitting Regulations are required to be demonstrated, including the use of Best Available Techniques (BAT) where applicable.	The assessment of potential noise and vibration impacts is included in this chapter of the ES. It identifies likely impacts arising from the Proposed Development (Section 9.6) and sets out mitigation measures where necessary (Section 9.7). Consultation with relevant stakeholders, including regulators, has also been undertaken as part of the ES process and is detailed in Section 9.3 Stakeholder engagement and consultation. Compliance with Environmental Permitting Regulations, including the use of BAT, will be demonstrated through the mitigation measures outlined in Section 9.5 and the Framework Construction Environmental Management Plan (fCEMP).
4.15.1-4.15.6 Common Law Nuisance and Statutory Nuisance	Applicants should identify potential sources of statutory nuisance such as noise and vibration, under section 79(1) of the Environmental Protection Act 1990 and demonstrate how these will be mitigated. This is necessary so that appropriate requirements can be included in the DCO.	The assessment of potential noise and vibration impacts is included in this ES. It identifies likely impacts arising from the Proposed Development (Section 9.6) and sets out mitigation measures where necessary (Section 9.7). Consideration to the Environmental Protection Act 1990 (EPA) has been given as part of the EIA work. The EPA is applicable to noise and vibration assessment, and it notes that local authorities have a duty to investigate noise complaints from premises, machinery or equipment. A Statement of Statutory Nuisance has been developed as part of the DCO (Statutory Nuisance Statement (Application Document Ref. 5.5)) .
5.12.1-5.12.18 Noise and Vibration	Applicants should carry out a noise and vibration impact assessment identifying noise sources, proximity to sensitive receptors, characteristics of	The assessment of potential noise and vibration impacts is included in this ES. It identifies likely impacts arising from the Proposed

Relevant paragraph reference	Summary of relevant NPS paragraph	Where addressed in
	the noise source and predicted impacts during construction and operation. They should include mitigation measures and consult relevant regulators and stakeholders. The Secretary of State will grant consent only if satisfied that noise impacts are avoided or minimised and may impose specific noise limits and mitigation in the Development Consent Order.	Development (Section 9.6) and sets out mitigation measures where necessary (Section 9.7). Consultation with relevant stakeholders, including regulators, has also been undertaken as part of the ES process and is detailed in Section 9.3 Stakeholder engagement and consultation.
EN-3 National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) [Ref 9]		
3.5.2 Consideration of good design for energy infrastructure	Proposals for renewable energy infrastructure should demonstrate good design, particularly in respect of landscape and visual amenity, opportunities for co-existence/co-location with other marine uses, and in the design of the project to mitigate impacts such as noise and effects on ecology and heritage.	Mitigation measures to minimise noise from operation and construction of the Proposed Development are presented as part of this ES in Section 9.7, which is evidence of good design.

Standards and guidance

Table 9.5 Noise and vibration standards and guidance

Standard/Guidance	Relevance to assessment
British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound (BS 4142) [Ref 14]	Relevant for the assessment of operational noise and for the environmental sound survey methodology.
British Standard 5228:2009+A1:2014 Part 1 (Noise) and Part 2 (Vibration): Code of practice for noise and vibration control on construction and open sites (BS 5228) [Ref 1]	Describes methodologies and assessment criteria for the assessment of construction noise and vibration.
British Standard 7445-1:2003 Description and measurement of environmental noise – Part 1; Guide to quantities and procedures (BS 7445-1) [Ref 15]	Defines how an environmental sound survey should be carried out.
British Standard 6472-1:2008 Guide to evaluation of human exposure to vibration in buildings – vibration sources other than blasting [Ref 16]	Relevant for the assessment of vibration impacts on people
British Standard 7385-2:1993 Evaluation and measurement for vibration in buildings - Guide to damage levels from groundborne vibration (BS 7385-2) [Ref 17]	Defines criteria for assessing vibration damage risk to buildings.

Standard/Guidance	Relevance to assessment
ISO 9613-2: 2024 Acoustics-Attenuation of sound during propagation outdoors (ISO 9613-2) [Ref 13]	Defines how propagation of sound should be calculated.
Highways England (2020) Design Manual for Roads and Bridges LA 111 Noise and vibration (DMRB) [Ref 2]	Defines the assessment methodology for construction traffic and operational road traffic noise.
Department for Transport (1988) Calculation of Road Traffic Noise (CRTN) [Ref 21]	Sets out the assessment methodology for operational road traffic noise.
World Health Organization (WHO) Guidelines for Community Noise (1999); Environmental Noise Guidelines for the European Region (2018); and Night Noise Guidelines for Europe (2009) [Ref 18]	Relevant to establishing criteria to determine significance of effects associated with the operation of the Proposed Development.
Institute of Environmental Management and Assessment - Guidelines for Environmental Noise Impact Assessment (2014) [Ref 19]	Provides guidance on the assessment methodology for likely significant effects of noise and vibration for EIA.
Environmental Noise Measurement Guide (2021) The Association of Noise Consultants [Ref 20]	Provides guidance about measurement and analysis of environmental sound.
Noise impact assessments involving calculations or modelling. Environment Agency (EA) (2022) [Ref 26]	Identifies information to be submitted to the EA in a noise impact assessment that uses computer modelling or spreadsheet calculations, when required for permitting.
Procedure for the assessment of low frequency noise disturbance (2011) NANR45. Defra/University of Salford [Ref 25]	Provides guidance about low frequency noise impacts. Although not intended for use in planning assessments, it provides useful context for assessing the risk of complaints arising in future.
Noise and Vibration Management: Environmental Permits 2021 (Environment Agency (EA)) [Ref 28]	Guidance is provided to help holders and potential holders of permits to apply for, vary, and comply with their permits. This guidance covers how the environment agencies will assess: • noise from certain industrial processes; • what the law requires to manage noise and vibration; and • advice on how to manage noise – in particular, how to carry out a noise impact assessment and what operators should include in a noise management plan. Permitting applications require a noise assessment to be submitted to the EA.

9.3 Assessment methodology and significance criteria

Stakeholder engagement and consultation

- 9.3.1 This section describes the outcome of, and response to, the EIA Scoping Opinion [Ref 31] in relation to the noise and vibration of the Proposed Development.
- 9.3.2 The EIA Scoping Report was submitted to the Planning Inspectorate (PINS) in September 2025, and a Scoping Opinion was issued by PINS on 11 November 2025. A summary of the scoping opinion comments and how these have been considered is presented in Table 9.6 and Table 9.7.
- 9.3.3 The following stakeholders have been engaged with regard to noise and vibration as part of the consultation process:
- EA;
 - Natural England (NE);
 - Marine Management Organisation (MMO);
 - STBC; and
 - RCBC (no comments were received regarding noise and vibration during scoping).
- 9.3.4 Responses to the consultation submission from NE regarding noise assessment for terrestrial ecology are included in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1)**.
- 9.3.5 Responses to consultation submissions from the EA, NE and MMO regarding underwater noise assessment are included in **Chapter 11: Marine and Freshwater Ecology (ES Volume I, Application Document Ref. 6.1)**.

Table 9.6 Response to Planning Inspectorate Scoping Opinion comments on noise and vibration

Scoping Opinion ID & Ref	Scoping Opinion Comments	Responses
3.2.1 [Ref 31]	The Scoping Report states that a baseline vibration survey will not be conducted, as vibration assessments are based on absolute vibration levels rather than comparisons with background levels. The Scoping Report proposes to scope out impacts from vibration generated by construction traffic. The justification provided is that the construction traffic vehicles would be similar to the vibration caused by any other vehicles that could legally use the route.	The Planning Inspectorate's agreement that this matter can be scoped out of the assessment is acknowledged.

Scoping Opinion ID & Ref	Scoping Opinion Comments	Responses
	The Inspectorate agrees that construction vehicles are unlikely to lead to significant vibration effects and agrees that this matter can be scoped out of the ES.	
3.2.2 [Ref 31]	The Scoping Report proposes to scope out impacts from vibration generated from the proposed development on the grounds that the nearest human receptors are located more than 800m from the sources of operational vibration. The Inspector notes that the fixed plant and equipment is not yet confirmed (paragraph 1.7.1), however on the basis that the human receptors will be located more than 800m from sources of vibration, the Inspectorate agrees that this matter can be scoped out.	The Planning Inspectorate's agreement that this matter can be scoped out of the assessment is acknowledged.
3.2.3 [Ref 31]	The Scoping Report proposes to scope out impacts from vibration generated from the proposed development on the grounds that the nearest human receptors are located more than 800m from the sources of operational vibration. The Inspector notes that the fixed plant and equipment is not yet confirmed (paragraph 1.7.1), however on the basis that the human receptors will be located more than 800m from sources of vibration, the Inspectorate agrees that this matter can be scoped out.	The Planning Inspectorate's agreement that this matter can be scoped out of the assessment is acknowledged.
3.2.4 [Ref 31]	The Scoping Report provides justification for the different study areas used for human receptors during the construction and operational phase. Paragraph 6.3.2 states that these study areas may potentially be adjusted using professional judgment. Where professional judgement is used, this should be clearly expanded upon in the ES, agreed with relevant consultees where necessary and supported with evidence on how decisions have been reached.	Other than adapting to the latest red line boundary, the Study Areas have not been adjusted since the Scoping Report.
3.2.5 [Ref 31]	The Scoping Report states that the anticipated impacts of decommissioning activities are expected to be similar to those arising from construction activities, however no further reference to the decommissioning phase assessment is provided this aspect of the Scoping Report. Furthermore, since the construction phase is scoped in on the basis that significant effects could occur, there is potential for significant effects to occur within the decommissioning phase. See ID 2.1.10 in this regard.	Paragraph 9.3.2.7 in the ES has clarified that the decommissioning stage will involve fewer activities than the construction stage so the potential impact of the decommissioning stage should be similar (or less) than that of the construction phase.

Table 9.7 Response to Stockton-on-Tees Borough Council Consultation Response on noise and vibration

Scoping Opinion Comments	Responses
Construction/demolition noise I am concerned about the short-term environmental impact on the surrounding dwellings during construction/demolition, should the development be approved. My main concerns are potential noise, vibration and dust emissions from site operations and vehicles accessing the site. I would recommend that working hours of all construction/demolition operations including delivery/removal of materials on/off site shall be restricted to 08:00 – 18:00Hrs on weekdays, 09:00 – 13:00Hrs on a Saturday and no Sunday or Bank Holiday working. Should works need to be undertaken outside of these hours the developer should apply for consent under Section 61 Control of Pollution Act 1974. This would involve limiting operations on site that cause noise nuisance.	Based on the distances between the Proposed Development and residential NSRs (listed in Table 9.8), construction activities are not expected to give rise to noise impacts, as outlined in Paragraph 9.1.9. Construction noise will be monitored, as described in Section 9.8. A construction traffic noise assessment has been undertaken in Section 9.6 in accordance with DMRB LA 111 (2020) [Ref 2], which concludes there are no significant impacts. The Applicant has committed to working within the hours specified in Requirement 7 of Schedule 2 to the draft DCO (Application Document Ref. 3.1), save for the exceptions, controlled by Requirement 7(2). These are detailed in Section 9.5.
Noise disturbance from new plant The rating level of sound emitted from [any fixed plant and/or machinery associated with the development] [industrial activities at the use hereby approved] shall not exceed background sound levels by more than 5dB(A) between the hours of 0700-2300 (taken as a 1-hour LA90 at the nearest sound sensitive premises) and shall not exceed the background sound level between 2300-0700 (taken as a 15 minute LA90 at the nearest sound sensitive premises). All measurements shall be made in accordance with the methodology of BS4142: 2014 (Methods for rating and assessing industrial and commercial sound) and/or its subsequent amendments. Where access to the nearest sound sensitive property is not possible, measurements shall be undertaken at an appropriate location and corrected to establish the noise levels at the nearest sound sensitive property. Any deviations from the LA90 time interval stipulated above shall be agreed in writing with the Local Planning Authority.	Noise emission limits for the operational sound levels of the stacks and quayside unloading are outlined in Table 9.14, to ensure that rating levels at residential NSRs are limited to below the measured background sound level during the night-time and no greater than +5 dB above the daytime, in accordance with BS 4142:2014+A1:2019 methodology (see Section 9.3). Operational noise will be controlled further to Schedule 2 (Requirements) of the draft DCO (Application Document Ref. 3.1). A baseline sound survey has been undertaken according to BS 4142:2014+A1:2019 to obtain existing background sound levels, see Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3) for details.

Scoping Opinion Comments	Responses
New road condition and noise increase from new housing estate/major development A noise consultant should undertake a noise assessment in-line with DMRB LA 111. Baseline noise data should be provided showing the $L_{A10, 18hr}$ 06:00- 24:00 (façade) & L_{Night} 23:00- 07:00 (free field) noise levels. The consultant should then advise if the noise levels fall within a LOAEL or SOAEL level in accordance with table 3.49.1. The report should then indicate the noise level increase of the proposed new road in relation to DMRB LA 111. Should noise levels increase by more than 3dB within a LOAEL, or by more than a 1dB within a SOAEL then mitigation measures will be needed to ensure these levels are not exceeded. Conclusions are to be drawn from table 3.54a and table 3.54b if the noise change will be 'major', 'moderate', 'minor' or 'negligible' over a short- and long-term scenario.	No new roads are to be constructed as part of the Proposed Development. Baseline sound level data has been collected and is reported in Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3). A road traffic noise assessment has been undertaken in line with DMRB LA 111 for the changes in traffic flow on existing roads during construction and operational phases. Please see Section 9.6.
Construction noise report A noise report for construction noise should be undertaken by a noise consultant and should be submitted to and approved in writing by the Local Planning Authority prior to any construction work commencing. As part of the noise report the existing ambient noise levels at the nearest residential properties should be obtained and the noise levels of each proposed construction activity to be undertaken should be calculated to the nearest residential properties. The assessment and impact of the construction noise should be undertaken in accordance with the ABC method and table E.1 of BS5228 where the ambient noise level should be rounded to the nearest 5dB to determine the appropriate threshold value. Suitable mitigation measures should be implemented where the construction noise is predicted to exceed the appropriate threshold value.	A construction noise assessment for residential NSRs has been undertaken in accordance with BS 5228-1:2009+A1:2014 ABC Method. Please see Section 9.6. Construction noise assessment and proposed mitigation for ecology receptors is reported in Chapter 10: Terrestrial Ecology and Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1). A baseline sound survey has been undertaken to obtain existing background sound levels, see Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3) for details.

Noise sensitive receptors

9.3.6 The following residential properties were scoped in as the nearest NSRs (with approximate distances listed) to the Proposed Development for assessment for direct impacts:

- Properties on Saltview Terrace, Port Clarence (NSR1), to the south west, 2.5km from the nearest operational noise sources on the Main Site and construction activities;
- Properties on Marsh House Lane, Greatham (NSR2), to the north west, 2.9km from operational noise sources on the Main Site and nearest construction activities;

- Properties on Upper Graham Street, South Bank (NSR3), to the south, 2.8km from operational noise sources on the Main Site and 2km from nearest construction activities;
 - Properties on Cowpen Lane, Cowpen Bewley (NSR4), to the west, 3.5km from operational noise sources on the Main Site and 2.8km from nearest construction activities; and
 - Properties on Wilton Avenue, Dormanstown (NSR5), to the south east, 4km from operational noise sources on the Main Site and 1.8km from nearest construction activities, but less than 300m away from a vehicular (including HGVs) access route within the Proposed Development.
- 9.3.7 The following residential properties are scoped in for construction and operational road traffic noise assessment of indirect impacts:
- Properties in north Billingham, to the north west, within 50m of the A1185.
- 9.3.8 Marsh Farmhouse, Warrenby was initially scoped in as an NSR at the Preliminary Environmental Information Report (PEIR) stage. However, upon review, it was scoped out at the ES stage, as the distance from operational noise sources (over 4km away) and nearest construction activities (over 2km away) meant any adverse impacts would be very unlikely.
- 9.3.9 The NSRs for this assessment are listed in Table 9.8 which also outlines the receptor types, distance from the Main Site and what assessment is undertaken at each NSR. A map of the NSRs is also presented in **Figure 9.4 (ES Volume II, Application Document Ref. 6.2)**.
- 9.3.10 As described in Paragraph 9.1.9, NSRs at Port Clarence, Marsh House Lane, South Bank and Cowpen Bewley are outside the 300m Study Area. While construction noise may be audible at these NSRs, the distances between the NSRs and the Main Site (see distances in Table 9.8) mean that significant effects due to construction noise are not expected at the NSRs outside of the Study Area.

Table 9.8 Details of assessed NSRs, with receptor type and assessment type.

NSR	Address	Receptor type	Assessed for	Distance from Main Site (km)
NSR1	Saltview Terrace, Port Clarence	Residential	Operational noise from the Main Site	2.5
NSR2	Marsh House Lane, Greatham	Residential	Operational noise from the Main Site	2.9

NSR	Address	Receptor type	Assessed for	Distance from Main Site (km)
NSR4	Upper Graham Street, South Bank	Residential	Operational noise from the Main Site	2.8
NSR5	Cowpen Lane, Cowpen Bewley	Residential	Operational noise from the Main Site	3.5
NSR6	Wilton Avenue, Dormanstown	Residential	Noise from nearby HGV access route during construction Operational noise from the Main Site	4

Upon review at the ES stage, NSR3 (Marsh Farmhouse, Warrenby), was scoped out due to the distance of the property from operational noise sources and nearest construction activities.

Baseline sound survey

- 9.3.11 Environmental sound level surveying was undertaken in March - April 2026 at locations representative of residential NSRs and ecological receptors to establish the baseline sound conditions surrounding the Proposed Development. More detail can be found in **Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3)**.
- 9.3.12 Where undertaking sound surveys was not possible, monitoring undertaken for other local projects was used to supplement the collected baseline sound data. These are outlined in Section 9.4.
- 9.3.13 The baseline sound conditions were used to establish assessment criteria in accordance with BS 4142:2014+A1:2019.

Construction activity noise

- 9.3.14 Assessments of construction noise have been undertaken in line with the methodologies presented in BS 5228-1:2009+A1:2014 [Ref 1]. The assessments were carried out for the construction works that may cause the greatest impact at the nearest NSRs and terrestrial ecological receptors within each phase of works.
- 9.3.15 The construction assessments were based on information available at ES stage, including the likely sound power level of construction plant items from BS 5228-1:2009+A1:2014 [Ref 1], percentage of on-time operation, number of items and any partial screening that could be implemented. In the absence of detailed information, reasonable worst-case assumptions were made based on benchmarking and experience from other similar projects.
- 9.3.16 Annex E of BS 5228-1:2009+A1:2014 describes the 'ABC' method, which defines thresholds of potential significant noise effects at dwellings [Ref 1].

Under this approach, the potentially significant effect threshold at a dwelling is determined using the existing ambient sound level, rounded to the nearest 5dB and evaluated in relation to the thresholds set out in Table 9.9.

Table 9.9 BS 5528 Part 1 – ABC method for determining the threshold of potential significant effect at dwellings

Assessment category and threshold value period	Threshold values in decibels (dB), $L_{Aeq,T}$		
	Category A	Category B	Category C
Night-time (23:00 – 07:00)	45	50	55
Daytime (07:00 – 19:00) Saturdays (07:00 – 13:00)	65	70	75
Other: Weekday evenings (19:00 – 23:00) Saturdays (13:00 – 23:00) Sundays (07:00 – 23:00)	55	60	65
Where: Category A: threshold values to use when ambient sound levels (rounded to the nearest 5dB) are less than these values. Category B: threshold values to use when ambient sound levels (rounded to the nearest 5dB) are the same as category A values. Category C: threshold values to use when ambient sound levels (rounded to the nearest 5dB) are higher than category A values.			

9.3.17 BS 5228-1:2009+A1:2014 notes that a potential significant effect is indicated where the construction site noise ($L_{Aeq,T}$) level exceeds the threshold level for the category appropriate to the ambient noise level. The standard also notes that if the ambient sound level exceeds the Category C threshold The identification of likely significant effects values given in Table 9.9, i.e. the ambient sound level is higher than the Category C values, then a potential significant effect is identified if the total $L_{Aeq,T}$ noise level for the period increases by more than 3dB due to site noise.

9.3.18 Having established whether there is a potential significant effect using the 'ABC' method, the final assessment of significance is made by considering the following:

- Exceedance over the established thresholds of potential significant effect;
- The levels of noise exposure and character of the existing sound environment;
- Combined exposure to construction noise and vibration;
- The duration of the construction impact;
- Effectiveness of mitigation measures that may be provided; and

- Professional judgement.
- 9.3.19 Additionally, the effect levels have been defined in government policy terms, that is Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL) and are based upon the ABC method described above. These thresholds are presented in Table 9.10.
- 9.3.20 It is noted that the potential impacts associated with decommissioning activities are likely to be similar to or less than those for construction activities, as the activities are expected to be broadly similar but without the works on the quay, construction of the development platform and piling.

Table 9.10 Thresholds of potential effects of construction noise in policy terms

Level of effect	Threshold value, 1m in front of the relevant façade (dBL _{Aeq,T})
LOAEL	Day: 65 Evening: 55 Night: 45
SOAEL	Day: 75 Evening: 65 Night: 55
Note: Day is 07:00 to 19:00, evening is 19:00 to 23:00 and night is 23:00 to 07:00	

- 9.3.21 The assessment of construction noise impacts on residential NSRs is outlined in Section 9.6.
- Construction traffic noise**
- 9.3.22 Construction traffic noise predictions have been undertaken in accordance with the methodology defined in CRTN (1988) [Ref 21] and in DMRB LA 111 [Ref 2]. The results of the predictions are used as a screening exercise to determine whether changes in traffic flow and composition during construction works and operation are likely to give rise to a noise level change of more than 1dB(A), this being the lowest perceptible change in road traffic noise.
- 9.3.23 The change in Basic Noise Level (BNL) is calculated using CRTN as required by DMRB. The magnitude of impact from noise of construction traffic on the public highways is determined using the criteria outlined in Table 9.11.
- 9.3.24 The identification of likely significant effects is based upon:
- The change in traffic noise levels and magnitude of impacts at assessed receptors with reference to Table 9.11;

- The levels of noise exposure and character of existing sound environment;
- The sensitivity of non-residential receptors (for example, reduced sensitivity if receptors have good noise insulation, or increased sensitivity if a building is regularly used by people with hearing impairments);
- The duration of the construction traffic noise impact; and
- Professional judgement, taking into account all the above and other influences, such as the location of noise sensitive parts of a receptor, acoustic context, and likely perception of change by residents.

Table 9.11 Magnitude of impact at receptors from construction traffic noise

Magnitude of impact	Increase in BNL of closest public road used for construction traffic (dB)
Major	Greater than or equal to 5.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Minor	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

9.3.25 As defined in DMRB LA 111, for diversion routes used at night, a major magnitude of impact of construction traffic noise is identified at any noise sensitive receptor within the diversion route Study Area.

9.3.26 Noise from construction traffic would constitute a potential significant effect where the impact is major or moderate and depending on the number of days for which the impact would exist at that magnitude.

Operational traffic noise

9.3.27 Operational traffic noise assessment has been undertaken in accordance with the methodology defined in CRTN (1988) [Ref 21] and in DMRB LA 111 (2020) [Ref 2]. This is based on the magnitude of change in operational BNL in the short-term and long-term due to the Proposed Development, defined in Table 9.12 and Table 9.13.

Table 9.12 Magnitude of change for operational traffic noise – short-term

Short-term magnitude	Short-term noise change (dB $L_{A10,18hr}$ or L_{night})
Major	Greater than or equal to 5.0
Moderate	Greater than or equal to 3.0 and less than 5.0
Minor	Greater than or equal to 1.0 and less than 3.0
Negligible	Less than 1.0

Table 9.13 Magnitude of change for operational traffic noise – long-term

Long-term magnitude	Long-term noise change (dB L _{A10,18hr} or L _{night})
Major	Greater than or equal to 10.0
Moderate	5.0 to 9.9
Minor	3.0 to 4.9
Negligible	Less than 3.0

9.3.28 Noise from operational traffic would constitute a potential significant effect where the impact is major or moderate.

Operational noise from stationary sources

Operational noise modelling

9.3.29 The typical activities on the Main Site most likely to give rise to adverse impacts at residential NSRs have been input into a three-dimensional noise prediction model. These noise sources include:

- Feedstock reception and storage, including ship unloading operations at the quay and use of conveyors from the quay to storage;
- Sustainable Aviation Fuel (SAF) production, including pre-treatment and gasification;
- Combined Heat and Power (CHP) plant;
- Exhaust stacks (including from the CHP plant and SAF Production Facility); and
- Ventilation and temperature control plant such as fans, coolers, heaters.

9.3.30 Emergency plant has not been included as part of the prediction model, as it will not contribute to the typical operational noise. This includes flares, which will only be used for safety reasons or non-routine operational conditions.

9.3.31 The noise model includes details of the existing buildings, ground attenuation and topography of the Proposed Development and surroundings. The noise model considers the Main Site only and does not include the Wider Site as there are no significant operational noise sources along the connection corridors.

9.3.32 Information on topography of the Proposed Development and the surrounding area is taken from the National LiDAR Programme data published by Defra Survey open data and has been reviewed with data from recent topography surveys. Details such as building layout, type of ground (reflective or absorptive), location of receptors and other geospatial

information, are taken from OS OpenData, OS MasterMap Topography Layer and OS Address. The proprietary noise modelling software calculates the attenuation of noise emissions of the plant items in accordance with ISO 9613-2:2024 [Ref 13].

Noise emission limits

- 9.3.33 As set out in **Chapter 2: Assessment Methodology (ES Volume I, Application Document Ref. 6.1)**, the Rochdale Envelope approach was adopted to model a reasonable worst-case scenario. This reflects the fact that more detailed noise data for stacks and unloading operations will only become available at the point of detailed design. To reduce the likelihood of adverse operational noise effects at residential NSRs, operational noise emission limits have been calculated (Table 9.14). These limits have been calculated such that the noise emissions at the nearest residential NSRs do not exceed thresholds for adverse impact.
- 9.3.34 The calculated operational noise levels and predicted effects have been assessed and reported in Section 9.6, based on the stacks and quayside unloading being designed and operated to achieve the noise emission limits.

Table 9.14 Operational noise emission limits (sound power level, L_w dB re 10^{-12} W)

Source	dBA L_w	Octave Band Centre Frequency, Hz							
		63	125	250	500	1k	2k	4k	8k
Stacks*	101	115	111	105	98	89	81	72	59
Quayside unloading operations	93	98	97	93	91	87	83	81	74

*Low frequency noise from the stacks should be limited to 120 dB L_w in the 31.5 Hz frequency octave band. See Section 9.6 for details on low frequency assessment.

- 9.3.35 The mitigation of operational plant noise is secured by Schedule 2 (Requirements) of the **draft DCO (Application Document Ref. 3.1)**, which requires a scheme for the management and monitoring of operational noise of Work Nos. 1 and 2 prior to bringing those into commercial use. The scheme must be consistent with the principles of this Chapter of the Environmental Statement. Further, the requirement imposes decibel limits on operational noise, unless otherwise agreed with the relevant planning authority.

Operational noise assessment

- 9.3.36 An assessment of the potential impacts arising from operational noise sources has been undertaken in line with BS 4142:2014+A1:2019 [Ref 14] at the residential receptors closest to the Proposed Development (see Section 9.6). The standard assesses the impact of industrial noise based

upon the difference between the measured background sound level without the sound of the Proposed Development, and the 'rating level' of the Proposed Development, at the receiver location.

- 9.3.37 The 'background sound level' ($L_{A90,T}$) is defined in BS 4142 as the typical sound level existing in the absence of the 'specific sound level' at the receiver location. The specific sound level ($L_{Aeq,T}$) from the industrial source can be subject to a certain weighting (penalty) where it displays an identifiable character that will increase the noise impact (such as tonality, impulsivity, intermittency or otherwise distinctive character) to provide a 'rating level' ($L_{Ar,T}$). The background sound level is subtracted from the rating level and the difference used to inform the assessment of the effects.
- 9.3.38 BS 4142 states: *"The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs"*.
- 9.3.39 BS 4142 requires that an initial estimate of the impact of the specific sound is conducted by subtracting the measured background sound level from the rating level and considers the following:
- a) *"Typically, the greater this difference, the greater the magnitude of the impact;*
 - a) *A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;*
 - b) *A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and*
 - c) *The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context."*
- 9.3.40 Importantly, BS 4142 advises that where the initial estimate of the impact needs to be modified due to the context, all pertinent factors should be considered, including the absolute level of sound:
- "For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low."*

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night”.

- 9.3.41 Therefore, as operational plant is expected to operate 24 hours per day, 7 days a week, the proposed criterion for a likely significant effect is that the cumulative rating level of operational plant noise at residential NSRs does not exceed the representative background sound level at the NSR.
- 9.3.42 The significance of effects has been determined based on the methodology presented above and other factors including the acoustic context of the area, magnitude of exceedance, predicted rating levels, time of the day where impact occurs and professional judgement.

Assumptions and limitations

Baseline conditions

- 9.3.43 A baseline sound survey was undertaken in 2026 to establish the baseline conditions in the area around the Proposed Development and at the nearest residential NSRs, which is reported in **Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3)**.
- 9.3.44 Consideration has also been given to baseline sound levels reported in other published assessments for other schemes in the local area and unpublished survey data collected for Lighthouse Green Fuels Ltd in 2024 (reported in **Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3)**), which were verified by confirmatory measurements as described in Section 9.4.

Operational noise assessment

- 9.3.45 The modelling of operational noise sources has been undertaken by the Applicant based on manufacturer data and where necessary, is supplemented by information gathered from relevant literature. There may be differences from the noise from similar facilities, however this is unlikely to introduce adverse effects that are additional to those reported in Section 9.6, as reasonable worst-case plant noise levels have been assumed.
- 9.3.46 ISO 9613-2:2024 [Ref 13] has been used in the software to model sound propagation. The methodology in this standard has assumptions and limitations on how noise propagation can be affected by weather conditions, such as temperature gradients and wind conditions. The method assumes that the wind direction is always from source to receiver, which gives a reasonable worst-case at all residential NSRs.
- 9.3.47 The front-end engineering design (FEED) has been completed, and further details will be refined during detailed design, including the location of plant.

As a reasonable worst-case scenario, where exact source locations are not known yet, 'Rochdale Envelope' principles have been adopted [Ref 32].

This involves assessing the maximum (or where relevant, minimum) parameters for the elements where flexibility needs to be retained (such as the building dimensions or operational modes, for example).

- 9.3.48 As such, sources have been assumed to be located at likely positions within the site areas and at a reasonable maximum height, while considering the project design principles, as well as environmental noise constraints. Where necessary to supplement noise data from FEED, sound power levels from empirical measurements and similar schemes elsewhere have been used for input data.
- 9.3.49 Noise emission limits have been defined for the stacks and quayside unloading operations (see Table 9.14), as neither of these noise sources had specific plant noise data available to include in the noise prediction model at this stage of design development. The stacks are expected to be the largest contribution of noise at NSRs, given the source elevation. The quayside unloading operations, while expected to be intermittent, can take between five to six days at a time, including overnight operation. Therefore, noise emission limits for both of these major noise sources have been calculated. It is assumed that the design and operation will ensure that noise emitted by selected plant for these items will meet the noise emission limits.
- 9.3.50 A minimum sound reduction index (SRI) has been assumed for the façade of any enclosures and buildings with continuous operational plant located inside, to ensure that the sound levels (due to plant noise breakout from enclosures and buildings) at the nearest residential NSRs do not exceed thresholds for adverse impact. The minimum SRI is shown in Table 9.19 (Section 9.5).
- 9.3.51 As a reasonable worst case, this assessment assumes that all plant items operate simultaneously and at full capacity during the night (with the exception of infrequent, intermittent and emergency plant).
- 9.3.52 Underwater noise impacts from operation have been scoped out, as the annual number of anticipated transits during operation of the Proposed Development is 0.5% of the baseline traffic movements on the Tees (**Appendix 20A: Navigation Risk Assessment (ES Volume III, Application Document Ref. 6.3)**). Marine traffic underwater noise associated with operations of the Proposed Development is therefore not expected to be significant.

9.4 Baseline conditions

Baseline data sources

- 9.4.1 Table 9.15 outlines the sources of baseline sound level data for each residential NSR (baseline conditions for ecological receptors can be found in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1)**). Information on the 2026 sound surveys undertaken for this project can be found in **Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3)**. Additional measured baseline sound levels from other publicly available reports and data collected for Lighthouse Green Fuels Ltd in 2024 (unpublished) were used to supplement the 2026 sound survey data as described in Section 9.4.

Table 9.15 Sources of baseline sound level data for each NSR.

NSR	Address	Baseline sound level data source
NSR1	Saltview Terrace, Port Clarence	Data collected for Lighthouse Green Fuels Ltd in 2024 with verification measurements from the 2026 Arup sound survey (Appendix 9A: Baseline Sound Survey Report (ES Volume III Application Document Ref. 6.3)).
NSR2	Marsh House Lane, Greatham	2026 Arup sound survey (Appendix 9A: Baseline Sound Survey Report (ES Volume III Application Document Ref. 6.3)).
NSR4	Upper Graham Street, South Bank	2026 Arup sound survey (Appendix 9A: Baseline Sound Survey Report (ES Volume III Application Document Ref. 6.3)).
NSR5	Cowpen Lane, Cowpen Bewley	2026 Arup sound survey (Appendix 9A: Baseline Sound Survey Report (ES Volume III Application Document Ref. 6.3)).
NSR6	Wilton Avenue, Dormanstown	H2Teesside ES (2024) [Ref 23] with verification measurements from the 2026 Arup sound survey (Appendix 9A: Baseline Sound Survey Report (ES Volume III Application Document Ref. 6.3)).

Baseline sound surveys

- 9.4.2 To provide an assessment of the likely significance of noise from the Proposed Development in line with BS 4142:2014+A1:2019, it was necessary to identify and understand the baseline conditions in the Study Area. This provided a reference point against which potential changes in ambient sound can be assessed.
- 9.4.3 Environmental sound surveys were carried out at 13 locations around the Proposed Development from late March to late April 2026 to establish representative background sound levels at residential NSRs and ecological receptors. A map of the baseline sound survey locations is presented in

Figure 9.3: Locations of Baseline Environmental Sound Survey Results Used for the Proposed Development (ES Volume II, Application Document Ref. 6.2). The noise assessment for terrestrial ecological receptors (based on change from the background noise level) can be found in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1).**

9.4.4 **Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3)** contains the following regarding the environmental sound surveys:

- Details of measurement locations, including observations, noise levels and meteorological data;
- Measurement standards and methodology; and
- Tabular and graphical results.

9.4.5 Table 9.16 outlines details of the long-term, unattended measurement locations representing residential NSRs for the Arup 2026 sound survey. Details of the measurement locations representing ecological receptors can be found in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1).**

Table 9.16 Details of long-term, unattended measurement locations used for the 2026 sound survey.

Measurement ID	Address	Date and time	Description of sound environment
U4	Teesport Commerce Park	22 April 2026 12:45 to 29 April 2026 12:25	Daytime: Road traffic noise from the south (Dockside Road approximately 90m away, A66 approximately 700m away). General industrial noise from the north and west (cranes beeping and moving at drydocks, clanging, equipment moving, general hum). Occasional bird noise from the south (hedgerows between site and Dockside Road).
U5	Cowpen Lane, Cowpen Bewley	27 March 2026 09:55 to 08 April 2026 12:26	Daytime: Constant road traffic noise from the southwest (Cowpen Bewley Road, approximately 100m to the south west). Industrial noise (Cowpen Bewley Industrial Park - constant hum, occasional clanging) from industrial estate to the south west (approximately 300m away). Bird noise and leaves rustling from nearby trees.

Measurement ID	Address	Date and time	Description of sound environment
U6	Saltaire Terrace, Greatham	27 March 2026 10:32 to 08 April 2026 12:54	Daytime: Constant bird noise from nearby trees and bird feeder in garden. Occasional distant aircraft flyover noise. Distant road traffic noise to the north (A689). Church bells toll every 15 minutes.

Desktop sources

9.4.6 While every effort was made to undertake environmental sound measurements at all the residential NSRs, proxy measurement locations were used in some instances due to land access and safety issues. Where unattended noise measurements were not possible, attended measurements were taken to verify existing measured baseline sound levels from other publicly available reports. The following sources have been used to inform the existing conditions:

- Previous data collected for Lighthouse Green Fuels Ltd in 2024 (unpublished); and
- H2Teesside Environmental Statement (2024) Chapter 11 [Ref 23].

9.4.7 Table 9.17 outlines details of the measurement locations used from desktop sources.

Table 9.17 Details of measurement locations used from desktop sources.

Measurement ID	Address	Source	Date and time	Description of sound environment
NML2	RSPB/Teesside Environmental Trust land to north of Samphire Street, Port Clarence	Data collected for Lighthouse Green Fuels Ltd, 2024 (unpublished)	12 October 2023 09:00 to 13 October 2023 12:15	Daytime: Dominated by local traffic noise; contributions from industrial noise sources. Night-time: Traffic noise through early part of night, while industrial noise dominates in the latter part of the night-time period.
H6	58 Broadway West, Redcar	H2Teesside ES (2024) [Ref 23]	27 June 2023 10:51 to 04 July 2023 12:06	The dominant sound sources during the daytime were road traffic on Broadway West and other nearby roads. Additional sound sources were the industrial estate to the north and birdsong.

Established baseline conditions

- 9.4.8 A summary of the measured baseline sound levels (both from the 2026 sound survey conducted for this ES, and from desktop sources) are presented in Table 9.18, along with the residential NSRs that the measurements represent. Further details on methodology, measured sound levels, meteorological data, and justification of typical background sound levels can be found in **Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3)**. Maps of the NSR and baseline measurement locations can be found in **Figures 9.3 and 9.4 (ES Volume II, Application Document Ref. 6.2)**.

Table 9.18 Summary of baseline sound levels at measurement locations.

Measurement ID	Measurement address	Residential NSR represented	Measured sound level, dB				
			Typical $L_{A90,T}$		$L_{Aeq,T}$		
			Day (07:00 – 23:00)	Night (23:00 – 07:00)	Day (07:00 – 19:00)	Evening (19:00 – 23:00)	Night (23:00 – 07:00)
NML2*	RSPB/Teesside Environmental Trust land to north of Samphire Street, Port Clarence	NSR1 Saltview Terrace, Port Clarence	45	38	60**		57
U6	Saltaire Terrace, Greatham	NSR2 Marsh House Lane, Greatham	40	32	55	48	54
U4	Teesport Commerce Park	NSR4 Upper Graham Street, South Bank	43	41	51	46	48
U5	Cowpen Lane, Cowpen Bewley	NSR5 Cowpen Lane, Cowpen Bewley	45	39	51	49	48
H6 H2T ES [Ref 23]	58 Broadway West, Redcar	NSR6 Wilton Avenue, Dormanstown	46	42	56**		45

* Data collected for Lighthouse Green Fuels Ltd, 2024 (unpublished)

**The desktop sources only provided daytime (07:00 – 23:00) and night-time (23:00 – 07:00) $L_{Aeq,T}$ data.

- 9.4.9 At NSR1, verification measurements from the 2026 survey were within 3dB of the desktop sourced data at NML2, which was considered a correlation

that verified the desktop source. Lower, unattended measured sound levels from the desktop sources were used on a reasonable worst-case basis.

- 9.4.10 At NSR6, verification measurements were limited due to access constraints and safety concerns. The long-term background sound level measurement at H6 (H2Teesside ES) was 8dB lower than the verification measurements, therefore the H6 background sound level was used on a reasonable worst-case basis.
- 9.4.11 Full details of verification measurements and justification for typical background sound levels can be found in **Appendix 9A: Baseline sound survey report (ES Volume III, Application Document Ref. 6.3)**.

Future baseline

- 9.4.12 Future baseline sound levels at residential NSRs would be determined by any changes in road traffic and rail movements and other sources associated with nearby developments.
- 9.4.13 The following developments in the planning process have been identified as proposed developments that may include works adjacent to the Proposed Development, and could change the future baseline sound levels:
- H2NE;
 - Ethane2Power;
 - Teesport (PD Ports);
 - East Coast Hydrogen; and
 - Navigator Terminals.
- 9.4.14 In addition, the following consented developments are considered: Net Zero Teesside and Woodsmith developments.
- 9.4.15 As a reasonable worst-case approach, the noise impact thresholds for both construction and operational phases have been established based on the existing baseline sound levels. These do not account for any potential increases associated with proposed or committed developments in the vicinity of the Proposed Development.
- 9.4.16 This assumption ensures a robust assessment by maintaining a reasonable basis for determining potential impacts.
- 9.4.17 There are no climate change variables that would, in any reasonable timescales, materially affect the assessments as currently detailed within this chapter. Climate variables that may have relevance to the noise and vibration assessment are mean temperature, mean daily maximum temperature, and mean daily minimum temperature.

9.4.18 Climate change variables may directly affect the operation of temperature control plant such as fans, coolers and heaters, but are unlikely to significantly affect the noise levels predicted in the assessment because these plant items do not dominate overall operational noise emissions. These variables may also have an indirect effect on the average internal noise level if receptor windows are open more frequently (because of changes in temperature due to climate change). The changes are unlikely to be of sufficient magnitude to affect the assessment.

9.4.19 Changes to temperature or other meteorological conditions may slightly influence the baseline noise and vibration climate over a long period of time, but not within any ranges that could be quantified within the framework of this assessment.

9.5 Development design and impact avoidance

Embedded and good practice mitigation

9.5.1 Embedded mitigation describes elements of the inherent design of a scheme which limit noise emissions and do not require additional mitigation to be undertaken. Good practice measures are standard approaches and actions undertaken to avoid or reduce environmental impacts in line with good industry practice and legislative requirements.

Construction

9.5.2 To minimise the level of noise and vibration to which sensitive receptors will be exposed, construction will be conducted in accordance with the detailed CEMP, which will be developed in accordance with **Appendix 5A: fCEMP (ES Volume III, Application Document Ref. 6.3)**. This is included within the DCO Application and secured by a requirement of the DCO. The appointed contractor will also conduct works in line with Best Practicable Means (BPM) as defined in the Control of Pollution Act 1974 (CoPA) [Ref 3].

9.5.3 The list of mitigation measures described in this section is not exhaustive and will be revised as necessary if measures are identified as being required following more detailed assessment as the design develops.

9.5.4 The fCEMP contains control measures for environmental protection that will be adopted during construction and has taken into account the feedback provided by local authorities in the **Scoping Opinion (Appendix 1A, ES Volume III, Application Document Ref. 6.3)** and consultation process. Mitigation measures, based upon BS 5228-1:2009+A1:2014, will include, but not be restricted to:

- Careful selection of plant and construction methods. Only plant conforming to relevant national, EU or international standards, directives

and recommendations on noise and vibration emissions should be used;

- Design and use of site enclosures as required, housing and temporary stockpiles, where practicable and necessary, to provide acoustic screening at the earliest opportunity;
- Choice of routes and programming for the transport of construction materials, spoil and personnel;
- Careful programming so that activities which may generate significant noise are planned with regard to local residents and sensitive receptors;
- All vehicles and mechanical plant shall be fitted with effective exhaust silencers (without causing the engine to overheat nor interfere excessively with routine operations), as required, and shall be maintained in good and efficient working order and operated to minimise noise emissions; recommended by the manufacturers;
- All machines in intermittent use shall be shut down in the intervening periods between works or throttled down to a minimum. Lorry engines will be switched off, as soon as practicable, when vehicles are stationary;
- All compressors and generators shall be sound reduced models fitted with properly lined and sealed acoustic covers which shall be kept closed whenever the machines are in use, and all pneumatic percussive tools shall be fitted with mufflers or silencers that do not impair machine efficiency, as required;
- Noise emitting equipment which is required to run continuously shall be housed in a suitable acoustic enclosure where appropriate and practicable (see BS 5228 Part 1, Figures B.1, B.2 and B.3);
- Temporary noise barriers will be used to reduce noise levels where appropriate and practicable. Such measures can be particularly appropriate for stationary or near-stationary plant such as pneumatic breakers, piling rigs and compressors. Barriers should be located as close to the plant as possible and, to provide adequate attenuation, should have a mass per unit area of at least 7 kg/m²;
- Plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors and away from walls reflecting towards sensitive receptors;

- Materials for night-time working shall be delivered, where practicable, during normal hours of working and be placed as close as practicable to the work area for which they are required;
 - Where reasonably practicable, fixed items of construction plant shall be electrically powered in preference to combustion engine driven.
 - Optimal location of equipment within the Proposed Development to minimise noise disturbance;
 - Use of less intrusive alarms, such as broadband vehicle reversing warnings;
 - Contact details will be provided for local residents along the HGV access routes in case of complaints; and
 - A requirement in the **draft DCO (Application Document Ref. 3.1)** will secure both working hours and the approach to exceptions to these hours.
- 9.5.5 For the majority of activities, no specific additional mitigation measures beyond the fCEMP are proposed or expected to be required to address construction noise impacts at this stage.
- 9.5.6 More information and management plans for construction and environmental management and construction traffic management can be found in **Chapter 5: Construction (ES Volume I, Application Document Ref. 6.1)**, including overall site management in accordance with good industry practice and relevant British Standards, to mitigate and minimise impacts of construction works as far as is reasonably practicable.
- 9.5.7 An underwater construction noise assessment for quay construction has been undertaken and is included in **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**. Impacts have been considered and potential mitigation measures suggested to control underwater construction noise where required.

Operation

- 9.5.8 Paragraph 5.7.8 of the Overarching NPS for Energy EN-1 (UK Gov, 2025) [Ref 8] states that mitigation measures may include:
- engineering: prevention of a specific emission at the point of generation; control, containment and abatement of emissions if generated;
 - layout: adequate distance between source and sensitive receptors; reduced transport or handling of material; and

- administrative: limiting operating times; restricting activities allowed on the site; implementing management plans.

Façade acoustic performance

- 9.5.9 To reduce plant noise breakout from enclosures and buildings with continuous operational plant, the façade should meet the minimum sound reduction index (SRI) as specified in Table 9.19. The noise prediction model and assessment assumes this SRI for the façades of enclosures and buildings.

Table 9.19 Minimum sound reduction index required for the façade of enclosures and buildings

	R_w	Octave Band Centre Frequency, Hz							
		63	125	250	500	1k	2k	4k	8k
Minimum SRI	25	12	18	20	24	20	29	39	47

Additional mitigation measures

- 9.5.10 Noise from operational noise sources will be controlled through design to ensure compliance with local authority criteria, guidance from BS 4142:2014+A1:2019 and using Best Available Techniques (BAT). As the detailed design is still ongoing, further mitigation measures which can be implemented as part of the design have been included below. Typical attenuation of these measures is provided in Table 9.20:
- Selecting the location of plant and equipment within the Proposed Development to minimise potential noise impacts where practicable;
 - Orienting plant within the Proposed Development to use buildings and structures as noise barriers or positioning noise emitting items such as stacks, fans and air inlets away from sensitive receptors where practicable;
 - Specific noise limits for particularly noisy plant items and operations and selection of low noise emission plant where necessary;
 - Reducing breakout noise from plant by use of acoustic enclosures or by housing them within a building;
 - Reducing noise emissions associated with ventilation by resizing, using low-noise fans, and providing attenuators or acoustic louvres; and
 - Only where necessary, acoustic barriers in the form of either fences/screens and/or earth bunds.

Table 9.20 Examples of operational noise mitigation measures

Mitigation measure	Approximate attenuation dB(A)	Description
Plant selection	Depends on plant type	Lower-noise plant or plant with a low-noise mode may be specified if economically and practically viable.
Acoustic enclosures	25-45dB	Solid enclosures containing noisy plant, with any access doors or panels sealed. Additional ventilation equipment may be required if plant is enclosed.
Acoustic barriers	Up to 5dB for partial screening Up to 10dB for total screening	Solid acoustic barriers breaking line of sight between sources and receptors. Attenuation level is dependent on geometry: the efficacy reduces with increasing distance to receptors.
Attenuators	15-25dB	Attenuators installed to decrease noise emissions from cooling fans.
Acoustic louvres	15-17dB	Where airflow requirements preclude continuous solid enclosures, acoustic louvres may be included.

Decommissioning

- 9.5.11 The works which will take place during the decommissioning phase of the Proposed Development are expected to be similar in magnitude to (or less extensive than) those required for construction. Consequently, noise and vibration effects during decommissioning are anticipated to be equal to or lower than those during construction. The development platform, utility connections and quay are expected to be retained for future use by third parties and will not be decommissioned at the same time as the rest of Proposed Development.

9.6 Likely impacts and effects of the Proposed Development

Overview

- 9.6.1 This section presents the results of the assessment of likely significant effects with the embedded and good practice mitigation measures described in Section 9.5.

Construction noise

Ecological receptors

- 9.6.2 The assessment of construction noise impacts on terrestrial ecological receptors are reported in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1)**, and for marine ecological receptors, in **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**.

Residential receptors

- 9.6.3 The nearest residential NSRs to the west of the Proposed Development are in Port Clarence, approximately 2.5km from the nearest construction activities. These NSRs are outside the extent of the construction noise Study Area outlined in Section 9.1 and **Figure 9.2: Construction Noise and Vibration Study Area (ES Volume II, Application Document Ref. 6.2)**.
- 9.6.4 The nearest residential NSRs in South Tees are in Dormanstown, approximately 220m from a vehicular (including HGVs) access route within the Proposed Development (not a public highway). Based on a reasonable worst-case drive-by maximum sound pressure level of 85dB_{L_{Amax}} at 10m for an HGV movement on an access road (BS 5228-1:2009+A1:2014) [Ref 1], the resultant maximum sound pressure level at the nearest residential NSR in Dormanstown would be 58dB_{L_{Amax}}. The resultant equivalent continuous sound pressure level (L_{Aeq}) due to any number of lorry movements over the course of a day will be lower than this maximum level. As such, noise from construction related traffic on the access road is predicted to be below the ABC threshold for adverse impacts of 65dB_{L_{Aeq}} at the nearest residential NSRs in Dormanstown. Consequently, the construction activities are not expected to result in any construction noise impacts at the considered residential NSRs.
- 9.6.5 Based on the above, the assessment of construction noise impacts concludes that no significant effects would occur at residential NSRs.

Construction traffic

- 9.6.6 Information on construction traffic routes and flows on public roads is provided in **Chapter 18: Traffic and Transportation (ES Volume I, Application Document Ref. 6.1)**.
- 9.6.7 The construction road traffic noise has been calculated according to CRTN [Ref 21] and assessed according to DMRB LA 111 [Ref 2].
- 9.6.8 Results show that there will be a greater than 1 dB(A) (but less than 3 dB(A)) increase in basic noise level at residential NSRs located on the north side of Billingham within the 50m Study Area of the A1185, between Cowpen Woodland and Marsh House Avenue. There is an expected increase of 1.1 dB(A) due to construction traffic at these residential NSRs.
- 9.6.9 This magnitude of impact at the residential NSRs is assessed as a minor adverse impact (**not significant**), when compared to Table 9.11 (in accordance with DMRB LA 111 (2020) [Ref 2]).

Operational traffic

- 9.6.10 Information on operational traffic routes and flows is provided in **Chapter 18: Traffic and Transportation (ES Volume I, Application Document Ref. 6.1)**.
- 9.6.11 The operational road traffic noise has been calculated according to CRTN [Ref 21] and assessed according to DMRB LA 111 (2020) [Ref 2].
- 9.6.12 Results show that there will be a greater than 1 dB(A) (but less than 3 dB(A)) increase in basic noise level at residential NSRs located on the north side of Billingham within the 50m Study Area of the A1185, between Cowpen Woodland and Marsh House Avenue. There is an expected increase of 1.1 dB(A) due to operational traffic at these residential NSRs.
- 9.6.13 In the short term, the magnitude of change is assessed as minor when compared to Table 9.12 (in accordance with DMRB LA 111 [Ref 2]). In the long term, the magnitude of change is assessed as negligible when compared to Table 9.13 (in accordance with DMRB LA 111 [Ref 2]), giving rise to no significant effect in the short term or long term.

Underwater construction noise

- 9.6.14 An underwater construction noise assessment has been undertaken and is reported in **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**.

Operational effects – stationary sources

- 9.6.15 The predicted operational noise levels at residential NSRs are presented in Table 9.21. In the absence of plant noise characteristics, a +3 dB feature correction has been applied to the specific sound level to determine the rating level, as a reasonable worst-case.
- 9.6.16 The prediction of noise levels was carried out on the basis that the stacks and quayside unloading operations will meet the noise emission limits outlined in Table 9.14. The stacks are expected to be the largest contribution of noise at NSRs, given the source elevation. The quayside unloading operations, while expected to be intermittent, can take between five to six days at a time, including overnight operation. It is assumed that the design and operation will ensure that noise emitted by selected plant for these items will meet the noise emission limits.
- 9.6.17 Further assumptions made in the assessment of operational noise are described in Section 9.3.
- 9.6.18 For details about the location of the residential NSRs assessed relative to the Proposed Development, please refer to **Figure 9.4 Locations of NSRs (ES Volume II, Application Document Ref. 6.2)**. Baseline sound survey

locations can be found in **Figure 9.3: Locations of Baseline Environmental Sound Survey Results Used for the Proposed Development (ES Volume II, Application Document Ref. 6.2).**

Table 9.21 Predicted operational noise assessment results (under typical, non-emergency operating site conditions)

NSR	Address	Typical background sound level (dBL _{A90})		Specific sound level (dBL _{Aeq})		Rating level (dBL _{A,rTr})		Level relative to background (dB)	
		Day	Night	Day	Night	Day	Night	Day	Night
NSR1	Saltview Terrace, Port Clarence	45	38	32	32	35	35	-10	-3
NSR2	Marsh House Farm, Greatham	40	32	29	29	32	32	-8	0
NSR4	Upper Graham Street, South Bank	43	41	31	31	34	34	-9	-7
NSR5	Cowpen Lane, Cowpen Bewley	45	39	26	26	29	29	-16	-10
NSR6	Wilton Avenue, Dormanstown	46	42	17	17	20	20	-26	-22

9.6.19 The results of the BS 4142 assessment of daytime and night-time noise levels at residential NSRs are summarised in Table 9.22. In accordance with BS 4142, a low impact is identified at all considered residential NSRs. Therefore, operational noise is assessed as a **not significant** effect.

Table 9.22 BS 4142 assessment of predicted sound levels at NSRs

NSR	Address	BS 4142 daytime assessment	BS 4142 night-time assessment
NSR1	Saltview Terrace, Port Clarence	Low impact	Low impact
NSR2	Marsh House Farm, Greatham	Low impact	Low impact
NSR4	Upper Graham Street, South Bank	Low impact	Low impact
NSR5	Cowpen Lane, Cowpen Bewley	Low impact	Low impact
NSR6	Wilton Avenue, Dormanstown	Low impact	Low impact

Low frequency noise assessment

9.6.20 A low frequency assessment has been undertaken, comparing the predicted operational noise emission levels at the residential NSRs against the NANR45 reference curve [Ref 25].

9.6.21 The sound levels in the frequency band from 31.5Hz to 125Hz have been considered. The predicted operational noise emission levels at the

residential NSRs in these octave band frequency regions are below the NANR45 criterion curve for assessment of low frequency noise. Low frequency noise during operation of the Proposed Development is likely to be a low impact and is assessed as causing no significant effect.

Decommissioning effects

- 9.6.22 The works which take place during the decommissioning phase of the Proposed Development are expected to be similar in magnitude (or less extensive) than those required for construction. The quay is expected to be retained for future use by third parties and not decommissioned at the same time as the rest of the Proposed Development.
- 9.6.23 The assessment presented for construction noise and vibration impacts is therefore representative of the decommissioning phase.

9.7 Mitigation and enhancement measures

Construction and decommissioning phase

- 9.7.1 Significant adverse noise effects on residential NSRs due to construction (including decommissioning) activities have been assessed as unlikely and as such, no additional mitigation measures have been defined at this stage.
- 9.7.2 A construction noise assessment has been undertaken for ecological receptors, and this is reported in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1)**.
- 9.7.3 An underwater noise assessment covering construction and operation of the quay has been undertaken and is reported in **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**.

Operational phase

- 9.7.4 Based on the assessment of the operational phase, no additional mitigation is proposed, beyond the embedded mitigation identified in Section 9.5. The additional examples in Table 9.20 are intended to demonstrate the potential effectiveness of mitigation options.

9.8 Residual effects and conclusions

Overview

- 9.8.1 No significant adverse effects at residential NSRs have been identified in relation to construction, decommissioning or operational noise.
- 9.8.2 Effects and additional mitigation for terrestrial ecological receptors are reported in **Chapter 10: Terrestrial Ecology (ES Volume I, Application Document Ref. 6.1)**.

- 9.8.3 Effects and mitigation measures for marine ecological receptors are reported in **Chapter 11: Freshwater and Marine Ecology (ES Volume I, Application Document Ref. 6.1)**.

Construction and decommissioning effects

- 9.8.4 No significant adverse effects or additional mitigation for residential NSRs have been identified in relation to construction and decommissioning activity noise or construction traffic noise. As such, no residual significant effects due to construction and decommissioning activity noise are identified.

Operational effects

- 9.8.5 No significant adverse effects or additional mitigation have been identified for operational stationary plant and road traffic noise at residential NSRs. As such, no residual operational significant effects for residential NSRs are identified.

Monitoring

- 9.8.6 As specified in **Chapter 5: Construction Programme and Management (ES Volume I, Application Document Ref. 6.1)**, noise monitors will be installed at the Proposed Development, with a daytime and nighttime noise limit to be used during construction and agreed with STBC.
- 9.8.7 As described in **Chapter 5: Construction Programme and Management (ES Volume I, Application Document Ref. 6.1)**, commissioning of the Proposed Development will include testing of the process equipment and will take approximately 9 to 12 months. A commissioning plan will be required to be agreed with the EA under the Environmental Permit, which will specify monitoring and control procedures to be used and set out a schedule of commissioning activities.
- 9.8.8 Any additional monitoring requirements beyond the monitoring outlined in **Chapter 5: Construction Programme and Management (ES Volume I, Application Document Ref. 6.1)**, the baseline sound survey presented in Section 9.4, and measures presented in Section 9.5 and Section 9.7, are identified in **Appendix 5A: fCEMP (ES Volume III, Application Document Ref. 6.3)**, including a Construction Noise and Vibration Management Plan (CNVMP). The CNVMP will include a noise and vibration monitoring scheme developed to ensure compliance with construction noise and vibration limits.
- 9.8.9 For operational noise, monitoring measures will ensure that embedded mitigation measures are included (or an equivalent performance is achieved with an alternative design), and any plant selection and/or noise mitigation measures are verified to ensure they meet the design specifications.

9.9 Summary of significant effects

Overview

- 9.9.1 No potential significant effects associated with the construction, operation and decommissioning of the Proposed Development have been identified.

Cumulative

- 9.9.2 The assessment of cumulative noise and vibration effects between the Proposed Development and other proposed and committed plans and projects is presented in **Chapter 22: Cumulative and Combined Effects (ES Volume I, Application Document Ref. 6.1)**.

References

- Ref 1 British Standards (2014). BS 5228:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites - Noise (Part 1) and Vibration (Part 2).
- Ref 2 Highways England, Transport Scotland, Welsh Government and Department for Infrastructure (2020) Design Manual for Road and Bridges (DMRB) LA 111 – Noise and Vibration Revision 2.
- Ref 3 Government of the United Kingdom of Great Britain and Northern Ireland (1974). Control of Pollution Act. Available online: <https://www.legislation.gov.uk/ukpga/1974/40> (Accessed September 2025).
- Ref 4 Government of the United Kingdom of Great Britain and Northern Ireland. (2015). The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015. Available online: <https://www.legislation.gov.uk/uksi/2015/227> (Accessed August 2025).
- Ref 5 Government of the United Kingdom of Great Britain and Northern Ireland (1990) Environmental Protection Act. Available online: <https://www.legislation.gov.uk/ukpga/1990/43/contents> (Accessed September 2025).
- Ref 6 Ministry of Housing, Communities & Local Government (2026) National Planning Policy Framework. Available online: https://assets.publishing.service.gov.uk/media/6a8334c03bd75b81e2329ac4/National_Planning_Policy_Framework.pdf (Accessed September 2026).
- Ref 7 Government of the United Kingdom of Great Britain and Northern Ireland (2010) Noise Policy Statement for England. Available online: <https://www.gov.uk/government/publications/noise-policy-statement-for-england> (Accessed September 2025).
- Ref 8 Government of United Kingdom of Great Britain and Northern Ireland (2025) Overarching National Policy Statement for energy (EN-1). Available online: <https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1-2025/overarching-national-policy-statement-for-energy-en-1-2025-accessible-webpage>. (Accessed May 2026).
- Ref 9 Government of the United Kingdom of Great Britain and Northern Ireland (2025) National Policy Statement for Renewable Energy Infrastructure (EN-3). Available online: <https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3-2025/national-policy-statement-for-renewable-energy-infrastructure-en-3-2025-accessible-webpage>. (Accessed May 2026).

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