ENVIRONMENTAL STATEMENT – VOLUME 1 – CHAPTER 7 NOISE AND VIBRATION

Drax Bioenergy with Carbon Capture and Storage

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

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7. NOISE AND VIBRATION

7.1. INTRODUCTION

7.1.1. This chapter reports the outcome of the assessment of likely significant environmental effects arising from the Proposed Scheme on Noise and Vibration.

7.1.2. Impacts during the construction and operational phases of the Proposed Scheme are assessed. A full description of the Proposed Scheme is described in **Chapter 2 (Site and Project Description)** of this ES (document reference 6.1.2).

7.1.3. This chapter (and its associated figures (**Volume 2**) and appendices (**Volume 3**)) is intended to be read as part of the wider ES. An assessment of the noise predictions presented in this chapter for biodiversity receptors is presented in **Chapter 8 (Ecology)**.

7.1.4. This chapter:

a. Summarises the legislative and policy framework;
b. Describes consultation undertaken to date;
c. Describes the methodology followed for the assessment;
d. Identifies the potential impacts as a result of the Proposed Scheme;
e. Details the design, mitigation and enhancement measures that have been identified;
f. Reports the assessment of the significant effects of the Proposed Scheme; and
g. Details the monitoring that should be carried out for the Proposed Scheme.

7.1.5. The Proposed Scheme has the potential to affect Noise and Vibration as a result of the following activities:

a. During construction / decommissioning:
  i. The likely noise effects arising from the Proposed Scheme construction and decommissioning traffic; and
  ii. Likely noise and vibration effects arising from the construction and decommissioning activities.

b. During operation:
  i. Likely noise effects arising from the Proposed Scheme operational traffic; and
  ii. Likely noise effects arising from the operation of the post combustion carbon capture technology included in the Proposed Scheme.

7.1.6. For the purposes of this assessment, it has been assumed that noise and vibration sources associated with the decommissioning phase are equivalent to those assessed for the construction phase. Construction and decommissioning are therefore considered together.

OPTIONALITY

7.1.7. For the purposes of this assessment the options, as described in **Chapter 2 (Site and Project Description)**, paragraph **2.2.3** affects the construction assessment only. The following has therefore been assessed:

a. Option 2: The Carbon Capture Plant associated with Unit 1 and Unit 2 as well as the Common Plant to be constructed at the same time. This provides a worst-case assessment with construction plant items potentially operating simultaneously.

7.1.8. The options described in **Chapter 2 (Site and Project Description)** for steam extraction (paragraph **2.2.37**) and the Carbon Dioxide Delivery Terminal Compound (paragraph **2.2.44**) would not affect this assessment.

7.2. LEGISLATIVE AND POLICY FRAMEWORK

LEGISLATIVE FRAMEWORK

7.2.1. The applicable legislative framework is summarised as follows.

Legislation

The Control of Pollution Act (1974)

7.2.2. The principal legislation covering demolition and construction noise is the Control of Pollution Act 1974, Part III. Sections 60 and 61 of the Act give the local authority special powers for controlling noise arising from construction and demolition works, regardless of whether a statutory nuisance has been caused or is likely to be caused. Works within the scope of these provisions include repair and maintenance work and road works. These powers may be exercised either before works start or after they have started.

7.2.3. Section 60 enables a local authority in whose area work is going to be carried out, or is being carried out, to serve a notice of its requirements for the control of Site noise and vibration on the person who appears to the local authority to be carrying out the works. Such a notice may also be served on others appearing to the local authority to be responsible for, or to have control over, the carrying out of the works. This notice can:

a. Specify the plant or machinery that is or is not to be used;

b. Specify the hours during which the construction work can be carried out;

c. Specify the level of noise that can be emitted; and

d. Provide for any changes of circumstances.

7.2.4. Section 61 of the Act provides a mechanism for the main contractor to take the initiative and approach the local authority to ascertain its noise requirements before construction work starts. If a formal application for "*prior consent*" is received by the local authority it is obliged to give a decision within 28 days; failure to do so or the attachment of unnecessary or unreasonable conditions are grounds for appeal by the Applicant.

7.2.5. Parts of the Act have been superseded by the Environmental Protection Act 1990, which amongst other things empowers local authorities to issue a noise abatement notice where nuisance can be proven.

POLICY FRAMEWORK

National Policy

Overarching National Policy Statement for Energy (EN-1) (DECC, 2011)

7.2.6. The current Overarching National Policy Statement for Energy (Overarching NPS) sets out that operational noise including ancillary activities associated with development, such as increased road and rail traffic movements, or other forms of transportation should be assessed using the principles of the relevant British Standards (BS 4142, BS 6472 and BS 8233) where appropriate.

7.2.7. In regard of decision making the Overarching NPS states:

7.2.8. “The project should demonstrate good design through selection of the quietest cost-effective plant available; containment of noise within buildings wherever possible; optimisation of plant layout to minimise noise emissions; and, where possible, the use of landscaping, bunds or noise barriers to reduce noise transmission.

7.2.9. The IPC should not grant development consent unless it is satisfied that the proposals will meet the following aims:

a. Avoid significant adverse impacts on health and quality of life from noise;

b. Mitigate and minimise other adverse impacts on health and quality of life from noise; and

c. Where possible, contribute to improvements to health and quality of life through the effective management and control of noise.”

7.2.10. The Overarching NPS identifies that for renewables there is assessment guidance for specific features of those technologies in National Policy Statement for Renewable Energy (EN-3). For the prediction, assessment and management of construction noise, reference should be made to British Standard BS 5228 and other guidance which also give examples of mitigation strategies.

Draft Overarching National Policy Statement for Energy (EN-1)

7.2.11. The Applicant is aware that the Government is currently updating the Energy NPSs, and it is anticipated that these will be published in 2022.

7.2.12. A draft version has been published for consultation in September 2021. This draft version includes considerations for assessment of underwater or subterranean noise where applicable. It also states that the relevant sections for noise within Noise Policy Statement for England (NPSE) and National Planning Policy Framework (NPPF) are considered within the Secretary of State (SoS) Decision making.

National Planning Policy Framework (Ministry of Housing, Communities and Local Government, 2021)

7.2.13. First published in 2012 and most recently updated in July 2021, the NPPF sets out the Government's planning policies for England and how these are expected to be applied. Noise is referenced within the document as follows:

7.2.14. "174. Planning policies and decisions should contribute to and enhance the natural and local environments by:…[a number of points including]…

preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans";

and

"185. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

a) mitigate and reduce to a minimum potential adverse impact resulting from noise from new development - and avoid noise giving rise to significant adverse impacts on health and the quality of life; and

b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.…".

7.2.15. Reference number 65 within NPPF paragraph 185(a) points to the Explanatory Note to the NPSE described in paragraphs **7.2.19 to 7.2.23**.

National Planning Practice Guidance (Ministry of Housing, Communities and Local Government, 2019)

7.2.16. This web-based resource was issued for use by the Department for Communities and Local Government (DCLG). The purpose of the guidance is to complement the NPPF and provide advice on how to deliver its policies.

7.2.17. The section on noise was first published on 6 March 2014 and most recently updated in July 2019. It includes a table that summarises "*the noise exposure hierarchy based on the likely average response of those affected"* and offers *"examples of outcomes*" relevant to the No Observed Effect Level (NOEL), Lowest Observed Adverse Effect level (LOAEL) and Significant Observed Adverse Effect Level (SOAEL) described in the NPSE. The term Unacceptable Adverse Effect (UAE) level is introduced which equates to noise perceived as "*present and very disruptive*". It is stated that UAEs should be prevented.

7.2.18. These outcomes are in descriptive form and there is no numerical definition of the NOEL, LOAEL and SOAEL (or UAE). The noise exposure hierarchy table is reproduced as **Table 7.1**.

Table 7.1 – Noise Exposure Hierarchy Based on the Likely Average Response

Perception	Examples of outcomes	Increasing effect levels	Action
No Observed Effect Level			
Not present	No Effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g., turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g., avoiding	Significant Observed Adverse Effect	Avoid

Perception	Examples of outcomes	Increasing effect levels	Action
	certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.		
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and / or an inability to mitigate effect of noise leading to psychological stress, e.g., regular sleep deprivation / awakening; loss of appetite, significant, medically definable harm, e.g., auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

Noise Policy Statement for England (Defra, 2010)

7.2.19. The NPSE seeks to ensure that noise issues are considered at the right time during the development of policy and decision making, and not in isolation. It highlights the underlying principles on noise management already found in existing legislation and guidance.

7.2.20. The NPSE sets out the long-term vision of Government noise policy as follows:

"Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development".

7.2.21. This long-term vision is supported by the following aims:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

a. Avoid significant adverse impacts on health and quality of life;

b. Mitigate and minimise adverse impacts on health and quality of life; and

c. Where possible, contribute to the improvement of health and quality of life" .

7.2.22. The NPSE employs the following categories of noise exposure which assist in determining the onset of adverse effects:

a. NOEL - No Observed Effect Level - This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise;

b. LOAEL - Lowest Observed Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected; and

c. SOAEL - Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur.

7.2.23. However, the NPSE goes on to state that:

"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available".

Local Policy

Selby District Local Plan

7.2.24. The Selby District Local Plan was published in 2005 and, together with the Selby District Core Strategy Local Plan (2013) identifies a number of policies that relate to noise, including as identified below:

Policy ENV2

"A) Proposals for development which would give rise to, or would be affected by, unacceptable levels of noise, nuisance, contamination or other environmental pollution including groundwater pollution will not be permitted unless satisfactory remedial or preventative measures are incorporated as an integral element in the scheme. Such measures should be carried out before the use of the site commences."

7.2.25. An assessment of the relevant policies is detailed further in the **Planning Statement** (document reference 5.2).

7.3. CONSULTATION

7.3.1. **Table 7.2** provides a summary of the consultation undertaken in support of the preparation of this assessment.

Table 7.2 - Consultation Summary Table

Date and Method of Consultation	Consultee	Summary of Key Topics discussed and Key Outcomes
23 April 2021 (Videoconference)	Selby District Council (SDC) and North Yorkshire County Council (NYCC)	Key Topic An indicative plan was provided showing the baseline noise monitoring locations. The Environmental Health Officer (EHO) representing SDC agreed that the long-term measurement points should be located in Barlow, Camblesforth, Long Drax and Drax. The EHO noted that the exact locations are not known so they cannot be agreed. Locations at Drax Abbey Farm and Wren Hall may be suitable location as long as it is not subject to excessive farming noise and would suggest that Foreman's Cottage may be an alternative. It was unclear to the EHO where LT6 would be located. A monitoring point on Camela Lane was suggested. Key Outcome A detailed plan was prepared showing the location of the noise monitoring and this was circulated to the attendees of the videoconference prior to undertaking the baseline monitoring. An additional noise monitoring at Camela Lane was included in this version. Key Topic The EHO discussed that the use of the most frequently occurring background noise levels is not a methodology that is agreed at present. With regards to construction noise assessment the EHO would expect the Background Noise Level to be equated to the "No observed effect level" not the "Lowest Observed Adverse Effect Level". **Key Outcome** Comments related to the determination of background noise levels and construction noise assessment have been taken into account in the preparation of the ES.
4 February 2022 (Videoconference)	Selby District Council (SDC) and North Yorkshire County Council (NYCC)	Key Topic The EHO representing SDC agreed the methodology proposed for the construction and operation assessments. The approach for determination of typical noise background levels was agreed. Key Outcome Assessment of construction noise and vibration will be prepared using 3D CadnaA noise model and ArcGIS. Assessment criteria would reference the document BS5228: 2009 Parts 1 and 2 + A1: 2014. The criteria would also use the ABC Method described within BS5228 and the Observed Effect Levels within the NPSE. EHO agreed to a Scoping assessment on construction traffic to be carried out in line with guidance from Design Manual for Roads and Bridges (DMRB) LA111. Non-core hour activities were discussed. The Applicant explained that activities are likely to be of similar nature to those already being carried out within buildings on the Drax Site. The Applicant also explained that a Construction Environmental Management Plan (CEMP) will be prepared by the contractor. An assessment of operational noise was prepared using 3D CadnaA noise model and ArcGIS. The assessment criteria was based on BS4142: 2014 + A1: 2019 and the calculation methodology followed ISO9613: 1996 - Part 2. The assessment includes the most up to date design information and input from the engineering team. Contextual considerations were included in the operational noise assessment. Consideration has been given to criteria in BS8233: 2014 Guidance on sound insulation and noise reduction for buildings (British Standards Institiute, 2014) and Noise Rating (NR) curves.

Date and Method of Consultation	Consultee	Summary of Key Topics discussed and Key Outcomes
		The EHO agreed with the proposed statistical analysis to derive the typical background noise levels using the dB L_{A90} noise levels occurring during 30% of the measurement period. This was included in the assessment presented in this chapter. The EHO agreed that a vibration assessment for the operational phase of the Proposed Scheme would not be required in the ES.

7.3.1. An EIA **Scoping Opinion** was received by the Applicant from the Planning Inspectorate (PINS) on behalf of the SoS on 26 February 2021, including formal responses from Statutory Consultees. The responses from PINS in relation to Noise and Vibration and how these requirements are addressed by the Applicant are set out in **Appendix 4.2 (Scoping Opinion Responses)** (document reference 6.3.4.2).

7.4. SCOPE OF THE ASSESSMENT

7.4.1. The scope of this assessment has been established through an ongoing Scoping process. Further information can be found in **Chapter 4 (EIA Methodology)** of this ES (document reference 6.1.4).

7.4.2. This section provides an update to the scope of the assessment and re-iterates the evidence base for Scoping out elements following further iterative assessment.

ELEMENTS SCOPED OUT OF THE ASSESSMENT

7.4.3. The elements shown in **Table 7.3** are not considered to give rise to likely significant effects as a result of the Proposed Scheme and have therefore not been considered within this assessment.

Table 7.3 - Elements Scoped Out of the Assessment

Element scoped out	Justification
Operational vibration	The operation of the new equipment is not expected to give rise to a significant effect at the nearest sensitive receptor. This approach has been agreed with SDC as recorded in the meeting minutes for the consultation with the EHO.

Elements Scoped into the Assessment

Construction and Decommissioning Phase

7.4.4. The following elements are considered to have the potential to give rise to likely significant effects during construction and decommissioning of the Proposed Scheme and have therefore been considered within this assessment:

a. Likely noise effects arising from the Proposed Scheme construction and decommissioning traffic; and

b. Likely noise and vibration effects arising from the construction and decommissioning activities.

Operational Phase

7.4.5. The following elements are considered to have the potential to give rise to likely significant effects during operation of the Proposed Scheme and have therefore been considered within this assessment:

a. Likely noise effects arising from the Proposed Scheme operational traffic; and

b. Likely noise effects arising from the operation of the post combustion carbon capture technology included in the Proposed Scheme.

7.5. ASSESSMENT METHODOLOGY

GUIDANCE AND DATA

BS 7445 (2003): Description and Measurement of Environmental Noise(British Standards Institute, 2003)

7.5.1. BS7445:2003 'Description and Measurement of Environmental Noise' defines and prescribes best practice during recording and reporting of environmental noise. It is inherently applied in all instances when making environmental noise measurements and is applicable to the baseline noise measurements taken to inform this chapter. The document advises that the information to be reported should include:

a. Measurement technique;

b. Conditions prevailing during measurements;

c. Qualitative data; and

d. Connotation of the sound.

BS 4142 (2014) + A1 (2019): Methods for rating and assessing industrial and commercial sound (British Standards Institute, 2014)

7.5.2. BS 4142 primarily provides a method by which to determine the significance of sound of an industrial nature (e.g., the ‘specific sound’ from proposed new plant units) at nearby noise sensitive receptors.

7.5.3. The specific sound level may then be corrected for acoustic characteristics using the penalties below, if appropriate:

a.	Tonality	up to 6 dB
b.	Impulsivity	up to 9 dB
c.	Intermittency	up to 3 dB
d.	Other sound characteristics	3 dB

7.5.4. This resultant level is then termed the ‘rating level’ (denoted as $L_{Ar,Tr}$), whether or not a penalty is applied.

7.5.5. An initial estimate of the impact is obtained by subtracting the background sound level from the derived rating level. Typically, the greater the difference, the greater its magnitude is. In the context of the Standard, adverse impacts include, but are not

limited to, annoyance and sleep disturbance. It also recommends the following assessment scale:

a. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on context;

b. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on context; and

c. 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.

Additionally, BS 4142 states:

"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".

BS 5228, Parts 1&2 (2009) + A1 (2014): Noise and Vibration Control on Construction and Open Sites (British Standards Institute, 2009)

7.5.6. Part 1 of this Standard provides the latest recommendations for basic methods of noise control where there is a need for the protection of persons living and working in the vicinity of, and those working on, construction and open sites.

7.5.7. The Standard includes guidance on assessing the significance of noise effects. In particular, Annex E provides a discussion on the different approaches to the assessment of construction noise, in doing so giving consideration to absolute noise levels (in section E2) and to two different approaches to setting criteria based on the ambient noise level ($L_{Aeq,T}$) in the absence of construction noise (in section E3).

7.5.8. The Standard suggests that where, in spite of the mitigation measures applied, the measured or predicted construction noise level exceeds 75 dB(A) (for a period of ten or more days of working in any 15 consecutive days or for a total of days exceeding 40 in any six-month period), a scheme for the installation of noise insulation (or the reasonable costs thereof) will be implemented by the developer or promoter.

7.5.9. In sub-clause E.3 an alternative approach is described based on considering the change in the ambient noise level that the construction noise causes. This approach is used commonly in EIAs. Two methods are described.

7.5.10. The first is the ABC method an example of which is set out in **Table 7.4** below (Table E.1 in the Standard). Three categories, A, B and C are described in terms of threshold noise levels for a daytime (07:00 to 19:00 weekdays, 07:00 to 13:00 Saturday), evening and weekend, and finally a night-time period (23:00 to 07:00). If the combined ambient noise and construction noise exceed the relevant threshold level this is initially deemed a 'significant effect'.

Table 7.4 – Example thresholds of potential significant effects at dwellings

Assessment category and threshold value period	Threshold value, in decibels, dB $L_{Aeq,T}$		
	Category A (A)	Category B (B)	Category C (C)
Night-time (23:00 − 07:00)	45	50	55
Evenings and weekends (D)	55	60	65
Daytime (07:00 − 19:00) and Saturdays (07:00 − 13:00)	65	70	75

Notes:

[1] A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the Site exceeds the threshold level for the category appropriate to the ambient noise level.

2] If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total LAeq,T noise level for the period increases by more than 3 dB due to Site noise.

[3] Applied to residential receptors only.

(A) Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.

(B) Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.

(C) Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.

(D) 19:00 – 23:00 weekdays, 13:00 – 23:00 Saturdays and 07:00 – 23:00 Sundays.

7.5.11. Annex F of the Standard provides guidance on estimating noise from construction sites. The estimation procedures described in this Annex take into account the more significant factors:

- **a.** The sound power outputs of processes and plant;
- **b.** The periods of operation of processes and plant;
- **c.** The distances from source to receiver;
- **d.** The presence of screening by barriers;
- **e.** The reflections of sound; and
- **f.** Additional attenuation from absorbent ground.

7.5.12. Four discrete prediction methods are described, two for stationary plant – the activity $L_{Aeq,T}$ method and the plant sound power method – and two for mobile plant – the method for mobile plant in a defined area and the method for haul roads.

7.5.13. Part 2 of the Standard provides the latest recommendations for basic methods of vibration control where there is a need for the protection of persons living and working in the vicinity of, and those working on, construction and open sites.

7.5.14. With respect to human exposure to building vibration, Table B1 of Annex B to BS 5228-2 provides guidance on the effects of vibration levels on human beings. This is reproduced in **Table 7.5** below.

Table 7.5 – BS 5228-2 Guidance on Effects of Vibration Levels

Vibration level	Effect
0.14 mm·s−1	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mm·s−1	Vibration might be just perceptible in residential environments.
1.0 mm·s−1	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
10 mm·s−1	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

7.5.15. Guide values for cosmetic damage to buildings are given in Table B.2 of the Standard, and this is reproduced below as **Table 7.6**.

Table 7.6 – BS 5228-2 Guidance on transient vibration guide values for cosmetic damage

Line (see Figure B1)	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures Industrial and heavy commercial buildings	50 mm·s^{-1} at 4 Hz and above	50 mm·s^{-1} at 4 Hz and above

Line (see Figure B1)	Type of building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
2	Unreinforced or light framed structures Residential or light commercial buildings	15 mm·s^{-1} at 4 Hz increasing to 20 mm·s^{-1} at 15 Hz	20 mm·s^{-1} at 15 Hz increasing to 50 mm·s^{-1} at 40 Hz and above
Notes: **[1] Values referred to are at the base of the building.** **[2] For line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.**			

7.5.16. It should be noted that the above guidance is for transient vibration.

ISO 9613 (1996): Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation (International Organisation for Standardization, 1996)

7.5.17. This Standard specifies methods of calculating the attenuation of sound propagating outdoors in order to predict the level of environmental noise at distant locations from various sound sources.

7.5.18. Part 2 specifies an engineering method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at a distance from a variety of sources.

Design Manual for Roads and Bridges (DMRB) (2020): LA111 Noise and Vibration (Highways England, 2020)

7.5.19. LA111 sets out Scoping assessment criteria for operational road traffic noise levels to gain an understanding of the need to undertake a further noise assessment. The Scoping criteria are as follows:

a. Is the project likely to cause a change in the Basic Noise Level (BNL) of 1 dB $L_{A10,18hr}$ in the opening year;

b. Is the project likely to cause a change in the BNL of 3 dB $L_{A10,18hr}$ in the future year compared to the opening year;

c. Does the project involve the construction of new road links within 600 m of noise sensitive receptors; and

d. Would there be a reasonable stakeholder expectation that an assessment would be undertaken.

7.5.20. DMRB advises that the Calculation of Road Traffic Noise (CRTN) (Department of Transport, 1988) method should be used to predict road noise emissions.

7.5.21. **Tables 7.7 and 7.8** below show the noise magnitude of impact for the short-term (opening year) and long-term (future year versus opening year) assessments.

Table 7.7 – Magnitude of Road Traffic Noise Impacts in the Short Term

Noise change, $L_{A10,18h}$ dB	**Magnitude of Impact**
0	No change
0.1 – 0.9	Negligible
1 – 2.9	Minor
3 – 4.9	Moderate
5+	Major

Table 7.8 – Magnitude of Road Traffic Noise Impacts in the Long Term

Noise change, $L_{A10,18h}$ dB	**Magnitude of Impact**
0	No change
0.1 – 2.9	Negligible
3 – 4.9	Minor
5 – 9.9	Moderate
10+	Major

CONSTRUCTION AND DECOMMISSIONING

7.5.22. A quantitative assessment has been undertaken to determine the likely construction noise effects arising from the Site following guidance set out in BS5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites (British Standards Institute, 2009). The standard provides advice on prediction methods, measurements, and assessment for the associated effect.

7.5.23. A quantitative assessment has been undertaken to determine the likely construction vibration effects following guidance in BS5228-2:2009+A1:2014 Code of practice of noise and vibration control on construction and open sites (British Standards Institute, 2009) and BS7385-2:1993 Evaluation and measurement for vibration in buildings (British Standards Institute, 1993).

7.5.24. For the purposes of this assessment, it has been assumed that noise and vibration sources associated with the decommissioning phase are equivalent to those assessed for the construction phase. Therefore, the methodology and results presented in this chapter for construction are applicable for both, construction and decommissioning phases.

7.5.25. The assessment in this chapter considers Best Practicable Means (BPM) as primary mitigation. These measures are described in the REAC, and they are secured via a requirement in schedule 2 of the draft DCO submitted with the Application. This will minimise the potential for significant effects during construction. Examples of these measures are included below:

a. The appropriate selection of plant, construction methods and programming: Only plant conforming with, or that is better than, relevant national or international standards and directives will be used;

b. Construction plant will be maintained in good condition with regards to reducing noise output; and

c. Design and use of Site hoardings and screens, where necessary, to provide acoustic screening at the earliest opportunity. Where practicable, gates to the Site will not be located opposite buildings containing noise sensitive receptors.

Construction Noise

7.5.26. A noise model using CadnaA has been prepared to predict the likely construction noise associated with the Proposed Scheme. Model settings are listed in **Appendix 7.1 (Construction Noise and Vibration Assessment Assumptions**) (document reference 6.3.7.1).

7.5.27. Information related to construction activities and programme can be found in **Chapter 2 (Site and Project Description) Section 2.3**. Noise modelling has been undertaken to determine the likely effects as a result of the following key activities:

a. Earthworks;

b. Civil Works; and

c. Carbon Capture Plant and Common Plant Installation.

7.5.28. Noise levels have been predicted based on sound pressure levels at 10 m for items of plant used during each construction activity. Sound pressure levels associated with items of plant operating during their respective construction activity are listed in **Appendix 7.1 (Construction Noise and Vibration Assessment Assumptions)**. The construction noise propagation has then been calculated at each sensitive receptor as a 'free-field' equivalent continuous noise level for all operating plant items in each construction activity.

7.5.29. Predicted noise levels have been assessed over the daytime, evening and night-time period in accordance with the ABC method described in BS5228-1 and paragraph 7.5.10 to determine the significance of effect at each sensitive receptor. The ABC

method defines thresholds of potentially significant effects based on the baseline ambient noise level of a period, categories for which are presented in **Table 7.4**.

7.5.30. The concepts from the NPSE defined in paragraph **7.2.22** have been followed to develop a magnitude of impact criteria. For residential receptors, exceedance of the ABC method threshold described in BS5228-1 relates to the SOAEL, and the LOAEL can be considered as the baseline noise levels. Given these criteria, the magnitude of impact can be defined as described in **Table 7.9**.

Table 7.9 – Construction Noise Magnitude of Impact Criteria

Magnitude of Impact	Construction Noise Level
Major	Above or equal to SOAEL + 5 dB
Moderate	Above and equal to SOAEL and below SOAEL +5 dB
Minor	Above or equal to LOAEL and below SOAEL
Negligible	Below LOAEL

7.5.31. In accordance with advice in DMRB LA111, construction noise effects may be considered significant where it is determined that a moderate or major magnitude of impact will occur for a duration longer than:

a. 10 or more days or nights in any 15 consecutive days or nights; or

b. A total number of days exceeding 40 in any 6 consecutive months.

Construction Vibration – Human receptors

7.5.32. The methodology described in BS5228-2 (**paragraphs 7.5.2 7 – 7.5.12**) has been followed to predict the propagation of vibration from the construction activities of piling and compacting. BS5228-2 describes significance criteria for determining effects on human receptors, and refers to BS7385: Part 2, 1993 to determine the impact on structures.

7.5.33. Vibration levels were predicated and assessed at the nearest sensitive receptor, details relating to the assumptions made in this assessment are found in **Appendix 7.1 (Construction Noise and Vibration Assessment Assumptions**).

7.5.34. For human receptors the thresholds of vibration perception are shown in **Table 7.6**. **Table 7.10** presents the magnitude of impact for construction vibration and relates to vibration levels at which minimal adverse comment is likely as described in BS5228-2.

Table 7.10 – Construction Vibration (Human) Magnitude of Impact

Magnitude of Impact	Construction Vibration Level
Major	Above or equal to 10 mm/s PPV
Moderate	Above and equal to SOAEL and below 10 mm/s PPV
Minor	Above or equal to LOAEL and below SOAEL
Negligible	Below LOAEL

7.5.35. The LOAEL relates to the lowest observed effect and in this case, it has been defined as the level of vibration which is perceptible (≥ 0.3 PPV mm/s). The SOAEL has been set as 1.0 PPV mm/s. Adverse health impacts relating to a significant effect is more difficult to quantify and BS5228-2 notes the following:

> "Guidance on the effects on physical health of vibration at sustained high levels is given in BS 6841, although such levels are unlikely to be encountered as a result of construction and demolition activities."

7.5.36. Significance of effect is therefore related to the duration and frequency of construction activities as well as the time period the activities would be experienced. Detailed information relating to construction activities and phasing is found in **Chapter 2 (Site and Project Description)**.

7.5.37. In accordance with advice in DMRB LA111, construction vibration effects on humans may be considered **significant** where it is determined that a moderate or major magnitude of impact will occur for a duration longer than:

a. 10 or more days or nights in any 15 consecutive days or nights; or

b. A total number of days exceeding 40 in any six consecutive months.

Construction Vibration – Buildings

7.5.38. BS5228-2 provides guidance on the transient vibration values for cosmetic damage as shown in **Table 7.6**. BS5228-2 references BS 7385-2 'Evaluation and measurement for vibration in buildings. Guide to damage levels from ground-borne vibration'. (British Standards Institute, 2009). BS 7385-2 states that the probability of damage from transient vibration tends towards zero at 12.5 mm/s peak component particle velocity. For continuous vibration, such as from vibratory rollers or tunnel boring, the threshold is around half this value.

7.5.39. BS 7385-2 states that minor damage is possible at vibration magnitudes that are greater than twice those given in **Table 7.6**, and major damage to a building structure can occur at values greater than four times the tabulated values. The descriptions to these damage categories are described in BS ISO 4866:2010:

a. Cosmetic - The formation of hairline cracks on drywall surfaces, or the growth of existing cracks in plaster or drywall surfaces; in addition, the formation of hairline cracks in mortar joints of brick / concrete block construction;
b. Minor - The formation of large cracks or loosening and falling of plaster or drywall surfaces, or cracks through bricks / concrete blocks; and
c. Major - The damage to structural elements of the structure, cracks in support columns, loosening of joints, splaying of masonry cracks, etc.

7.5.40. **Table 7.11** describes the magnitude of impact for continuous vibration given the descriptions provided in BS7385-2 and BS ISO 4866.

Table 7.11 – Construction Vibration (Building) Magnitude of Impact

Magnitude of Impact	Peak Particle Velocity (PPV) level (mm/s)	Damage category
Major	≥ 30	Major
Moderate	≥ 15	Minor
Minor	≥ 7.5	Cosmetic
Negligible	< 7.5	-

7.5.41. Construction vibration effects on buildings may therefore be considered **significant** where it is determined that a moderate or major magnitude of impact.

OPERATION

Operational Noise

7.5.42. A noise assessment has been undertaken in line with guidance described in BS4142:2014+A1:2019 (British Standards Institute, 2014). The method in this standard uses outdoor sound levels to assess the likely effects of sound on people due to the operation of industrial or commercial premises.

7.5.43. The method described in BS 4142 (British Standards Institute, 2014) compares the rating level of the sound source with the background sound level. The standard refers to the rating level, which describes the specific source level corrected by acoustic features, where appropriate. The difference in levels established is taken as an initial estimate of the magnitude of the impact:

a. “Typically, the greater this difference, the greater the magnitude of the impact;
b. A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
c. A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context; and

d. 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 impact 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."

7.5.44. Certain acoustic features can increase the significance of the impact over that expected from a direct comparison between the specific sound level of the source and the background sound level. Acoustic features of the source include characteristics that may attract attention such as tonality, impulsivity and intermittency. Acoustic features added to the specific sound level form the rating noise level.

7.5.45. **Table 7.12** describes the magnitude of impact for operational noise based on the initial estimate of the impact of the specific sound by subtracting the measured background sound level.

Table 7.12 – Operational Noise Magnitude of Impact

Magnitude of Impact	BS 4142 descriptor	Excess of rating level over background sound level
Major	Indication of a significant adverse impact, depending on the context.	Around +10 dB
Moderate	Indication of an adverse impact, depending on the context.	Around +5 dB
Minor	Not defined in BS4142	Between 0 and 5 dB
Negligible	Indication of a low impact, depending on the context	≤0

7.5.46. The significance is dependent on both the margin by which the rating level of the specific sound source exceeds the background sound level and also the context in which the sound occurs. Factors taken into consideration for the context may include:

a. The absolute sound level at the individual receptor;

b. The character and level of the residual sound compared to the character and level of the specific sound; and

c. The sensitivity of the receptor and whether dwellings already incorporate noise mitigation measures.

7.5.47. For residential receptors, indoor ambient noise criteria for dwellings BS8233:2014 (British Standards Institiute, 2014) can be used to provide absolute sound level context as a part of the assessment. These levels have been derived from exposure-

response studies involving transportation noise, however they serve as a useful means of providing context to assessments of similar broad band noise sources.

7.5.48. **Table 7.13** reproduces Table 4 from BS8233:2014 and outlines the internal ambient noise criteria appropriate for dwellings.

Table 7.13 – Indoor Ambient Noise Criteria for Dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35 dB $L_{Aeq,16hr}$	-
Dining	Dining Room / area	40 dB $L_{Aeq,16hr}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hr}$	30 dB $L_{Aeq,8hr}$

7.5.49. BS8233:2014 describes NR curves as a graphical method assigning a single rating number to a noise spectrum. It can be used to assess the acceptability of a noise spectrum for a particular application. BS8233:2014 refers to CIBSE Guide B2:2016 which advises on typical NR curves for typical applications including bedrooms.

7.5.50. A CadnaA noise model has been prepared to determine the likely noise impacts arising from the normal mode operation of the Proposed Scheme. The noise source data within the model has been ascertained through consultation with the design engineers. Noise sources from the Proposed Scheme are likely to include flue gas booster fans, Combined Power Turbine Buildings, pumps, Carbon Dioxide Compressor Buildings. **Figure 2.2 (Indicative Plant Equipment Layout Plan)** (document reference 6.2.2.2) shows the layout of the Proposed Scheme.

7.5.51. The primary mitigation embedded in the assessment requires that rating noise levels for normal mode of operation predicted at 1m from the façade of noise sensitive receptors as listed in **Table 7.25** and **Table 7.26** will not be exceeded. These noise levels have been included in the Register of Environmental Actions and Commitments (REAC) and will be secured through a requirement in the Development Consent Order (DCO). The requirement will include the development of a noise mitigation scheme prior commencement of the operation.

7.5.52. **Appendix 7.2 (Operational Noise Assessment Assumptions)** (Section 4 (Required Noise Levels)) details the frequency spectrum noise levels that have been assumed for each of the noise sources with primary mitigation implemented.

Table 7.14 – Operational Noise Level Assumptions

Plant	Location	Noise Level $L_{Aeq,T}$ dB(A)
Flue Gas Booster Fans	5m from the equipment	69

Plant	Location	Noise Level $L_{Aeq,T}$ dB(A)
Carbon Dioxide Compressor Buildings	5m from the building	53
Pumps	1m from each pump	80
Combined Power Turbine Buildings	5m from the building	63

7.5.53. The assumed noise levels presented in **Table 7.14**, or a similar configuration of values as appropriate to comply with the DCO requirement on operational noise, will be achieved through mitigation defined during detailed design. Below is an example of the measures that could be implemented to achieve this:

- **a.** A single acoustic enclosure for the Combined Power Turbine Buildings;
- **b.** A single acoustic enclosure for the pumps such that the noise level at 1m from each pump does not exceed 80 dB(A);
- **c.** Double acoustic enclosures for the carbo dioxide compressor buildings. Carbon Dioxide Compressor Buildings will include mechanical ventilation with appropriate noise silencing on air louvres;
- **d.** Double acoustic enclosures for the flue gas booster fans. Acoustic cladding for the ducting of the flue gas booster fans;
- **e.** Cladding on the building envelope of the Carbon Dioxide Compressor Buildings achieving the acoustic performance in **Appendix 7.2 (Operational Noise Assessment Assumptions)** (document reference 6.3.7.2).

7.5.54. Noise from other operational sources on-site have been excluded from the model in order to represent the impact of the Proposed Scheme only.

7.5.55. Details on assumptions adopted for the operational noise modelling are presented in **Appendix 7.2 (Operational Noise Assessment Assumptions)**.

Road Traffic Noise

7.5.56. A Scoping assessment was undertaken to determine the likely significance of the traffic generated by the Proposed Scheme during both construction and operation. This methodology has been based upon advice in DMRB LA111. The Scoping assessment has been based on noise predictions at source as a first step to understand the likely effects.

7.5.57. The Scoping assessment was based on a comparison of BNLs for road links, which is the noise level at 10 m calculated from traffic flows, within the study area for the following scenarios:

- **a.** Construction year 2026 (assumed peak year for construction): comparison of BNLs with construction traffic against BNLs without construction traffic. Results

are compared against the short-term magnitude of noise impact described in **Table 7.7**;

b. Operational year 2029: comparison of BNLs with operational traffic against BNLs without operational traffic. Results are compared against the short-term magnitude of noise impact described in **Table 7.7**; and

c. Baseline year 2018 versus do-minimum year 2029: comparison of BNLs without Proposed Scheme traffic in both years. Results are compared against the long-term magnitude of noise impact described in **Table 7.8**.

ASSESSMENT OF SIGNIFICANCE

7.5.58. Effects classified as **moderate or above** are considered to be **significant** and effects classified as below **slight or below** are considered to be **not significant.**

7.5.59. The matrix for determining significant effects, shown in **Table 4.1** in **Chapter 4 (EIA Methodology)** shows the defined descriptors for magnitude of impact (degree of change) and sensitivity of the receptor. For the purpose of this chapter, all assessed receptors are considered to have a high sensitivity. It is noted that, in this chapter, **minor** magnitude of noise impact for high sensitivity receptors is not considered to be **significant**. On this basis, the assessment of significance applied in this chapter can be summarised as follows:

Construction Noise Effects

7.5.60. Construction noise effects may be considered **significant** where it is determined that a moderate or major magnitude of impact will occur for a duration longer than:

a. 10 or more days or nights in any 15 consecutive days or nights; or

b. A total number of days exceeding 40 in any 6 consecutive months.

Construction Vibration Effects

7.5.61. Construction vibration effects on humans may be considered **significant** where it is determined that a moderate or major magnitude of impact will occur for a duration longer than:

a. 10 or more days or nights in any 15 consecutive days or nights; or

b. A total number of days exceeding 40 in any six consecutive months.

7.5.62. Construction vibration effects on buildings may be considered **significant** where it is determined that a moderate or major magnitude of impact.

Operational Noise Effects

7.5.63. Operational noise effects may be considered **significant** depending on both the margin by which the rating level of the specific sound source exceeds the background sound level and also the context in which the sound occurs. Magnitude of impacts described as moderate or major in **Table 7.12** may be considered **significant**, depending on the context.

Road Traffic Noise

7.5.64. Road traffic noise may be considered significant for magnitude of impacts described in **Table 7.7 and Table 7.8** as moderate or major.

METHOD OF BASELINE DATA COLLECTION

Desk Study

7.5.65. Noise Important Areas (NIAs) have been identified in the study area. There is one NIA approximately 1.5 km from the Order Limits including dwellings adjacent to the A1041. The source of the information is from the Noise Action Planning Important Areas Round 3 England, last updated December 2021 (Department for Environment, Food and Rural Affairs, 2021). The location of the NIA is shown in **Figure 7.1 (Baseline Noise Survey and Sensitive Receptor Locations)** (document reference 6.2.7.1) and **Figure 7.3 (Operational Predicted Mitigated Noise Levels)** (document reference 6.2.7.3).

Noise Survey

7.5.66. Noise monitoring was undertaken by the Applicant between 19 May 2021 and 16 June 2021 at representative locations near the Proposed Scheme in accordance with BS7445:2003 (British Standards Institute, 2003) and agreed with SDC. Additional data collected by the Applicant in 2020 and 2021 at permanent noise monitoring locations at the surrounding sensitive areas were also used to inform the assessment. Monitoring positions are shown in **Figure 7.1 (Baseline Noise Survey and Sensitive Receptor Locations)**.

7.5.67. A combination of long-term (LT) and short-term (ST) measurements were taken across 13 locations surrounding the Proposed Scheme and set at 1.2 m above the ground level in free field conditions. The noise parameters measured included L_{10}, L_{90}, L_{eq} and L_{max} over 15-minute logging intervals.

7.5.68. **Table 7.15** and **Table 7.16** presents the lists of LT and ST noise monitoring locations and their associated OS coordinates, identified on **Figure 7.1** (Baseline Noise Survey and Sensitive Receptor Locations).

Table 7.15 – List of Long-Term Monitoring Locations

ID	X	Y	Duration
LT1 (east of the Proposed Scheme)	467261.9	427158.7	8 June 2021 and 16 June 2021
LT2 (north-east of the Proposed Scheme)	468142	428087.1	8 June 2021 and 16 June 2021
LT3 (north of the Proposed Scheme)	467028.1	428280.2	8 June 2021 and 16 June 2021

ID	X	Y	Duration
LT4 (west of the Proposed Scheme)	465215.3	428431.9	19 May 2021 – 1 June 2021
LT5 (south-west of the Proposed Scheme)	465206.3	426071.8	19 May 2021 – 1 June 2021
LT6 (south-east of the Proposed Scheme)	466994.3	426019.2	19 May 2021 – 1 June 2021
LT7 (south-east of the Proposed Scheme)	467222.8	426400.7	19 May 2021 – 1 June 2021
LT8 (west of the Proposed Scheme)	465752.5	427875.3	8 June 2021 and 16 June 2021
Permanent Barlow (west of the Proposed Scheme)	464797.2	428390.6	1 February 2020 – 16 June 2021
Permanent Camblesforth (south-west of the Proposed Scheme)	465326.60	426126.07	1 February 2020 – 16 June 2021

Table 7.16 – List of Short-Term Monitoring Locations

ID	X	Y	Duration
ST1 (north of the Proposed Scheme)	466616.08	427800.01	45 minutes 8 June 2021 and 16 June 2021
ST2 (south-west of the Proposed Scheme)	464839.28	426306.32	45 minutes 8 June 2021 and 16 June 2021
ST3 (north of the Proposed Scheme)	466754.91	428064.65	30 minutes 8 June 2021

7.5.69. Weather data was logged during the entire duration of the noise monitoring using a weather station placed at LT7 logging wind speed, wind direction and rainfall. Data from the unattended monitoring during periods of precipitation and in which wind speed exceeded 5 ms^{-1} have been excluded from the analysis.

7.5.70. Noise monitoring forms including time periods, time history graphs, details of the equipment, present conditions and photographs of the locations are included in **Appendix 7.3 (Noise Monitoring Forms)** (document reference 6.3.7.3). The noise monitoring equipment holds laboratory calibration in accordance with requirements set in BS4142:2014+A1:2019, certificates of which are available on request.

Assessment Assumptions and Limitations

7.5.71. The following assumptions and limitations apply to this chapter:

Assumptions

a. Assumptions related to the construction noise and vibration assessment are presented in **Appendix 7.1 (Construction Noise and Vibration Assessment Assumptions)**;

b. Assumptions related to the operational noise assessment are presented in **Appendix 7.2 (Operational Noise Assessment Assumptions)**; and

c. Furthermore, as described in **Chapter 2 (Site and Project Description)** (document reference 6.1.2), the Applicant has full planning permission for the demolition of the redundant Flue Gas Desulphurisation (FGD) Plant and associated restoration works at Drax Power Station (2020/0994/FULM). The decommissioning and demolition works of Absorber Units 4, 5 and 6 are scheduled to take place prior to the start of the construction of the Proposed Scheme, whilst the demolition of Absorber Units 1, 2 and 3 are assumed to take place following the completion of the Proposed Scheme. The demolition of Units 1, 2 and 3 are assessed in **Chapter 18 (Cumulative Effects)** (document reference 6.1.18).

Limitations

a. Detailed design information for both construction and operation is not available at this stage. Assumptions are presented in **Appendix 7.1 (Construction Noise and Vibration Assessment Assumptions)** and **Appendix 7.2 (Operational Noise Assessment Assumptions).**

7.6. STUDY AREA

7.6.1. The study area for the construction noise and vibration assessment is a 1 km radius from the Order Limits. This has been based on guidance in BS5228 and professional judgement. BS5228 advises in Annex F (Informative) Estimating noise from sites that beyond 300 m construction noise predictions should be treated with caution.

7.6.2. The study area proposed in the operational noise assessment is a 2 km radius from the Order Limits based on professional judgement. Noise and vibration effects as a result of the Proposed Scheme would not be significant beyond this point based on the absolute noise levels expected at this distance. At this distance, rating levels arising from the Proposed Scheme would not exceed the existing background noise levels. Therefore, effects would not be significant outside of this study area.

7.7. BASELINE CONDITIONS

EXISTING BASELINE

7.7.1. **Table 7.17** presents the representative background sound level (L_{90}) and ambient (L_{eq}) level at each location, selected based on a statistical analysis of the measured sound levels during the monitoring period. The selection process aimed at choosing low background sound level events which occurred for 30% of the measurement period, based on the approach agreed with SDC.

7.7.2. Locations in **Table 7.17** and **Figure 7.1 (Baseline Noise Survey and Sensitive Receptor Locations)** are representative of residential noise sensitive receptors surrounding the Proposed Scheme focusing on Camblesforth, Barlow, Drax and isolated properties in the immediate vicinity. The table includes an indication of the area.

7.7.3. During analysis of the data it was noted that the sound level generally increased after 0400 due to birds singing at the start of the day known as the dawn chorus. While this is a naturally occurring phenomenon, it raises the baseline sound level over the night-time period and has therefore been excluded in order to provide a baseline sound level that reflects the quieter periods during the night.

Table 7.17 – Summary of Long-Term Sound Measurement Results

	Representative Background Sound Level (L_{A90}) dB		**Ambient Sound Level (L_{Aeq}) dB**	
ID	**Day**	**Night**	**Day**	**Night**
LT1 (east of the Proposed Scheme)	42	42	63	57
LT2 (north-east of the Proposed Scheme)	34	34	55	48
LT3 (north of the Proposed Scheme)	41	40	49	48
LT4 (west of the Proposed Scheme)	34	28	51	43
LT5 (south-west of the Proposed Scheme)	37	28	55	44

	Representative Background Sound Level (L_{A90}) dB		Ambient Sound Level (L_{Aeq}) dB	
ID	**Day**	**Night**	**Day**	**Night**
LT6 (south-east of the Proposed Scheme)	42	31	54	48
LT7 (south-east of the Proposed Scheme)	39	29	61	44
LT8 (west of the Proposed Scheme)	44	38	49	47
Permanent Barlow (west of the Proposed Scheme)	42	34	54	47
Permanent Camblesforth (south-west of the Proposed Scheme)	36	29	51	41

7.7.4. **Table 7.18** presents the short-term noise monitoring results. Locations ST1 and ST3 are representative of biodiversity receptors near the Proposed Scheme. Location ST2 represents residential noise sensitive receptors in Camblesforth.

Table 7.18 - Summary of Short-Term Sound Measurement Results

	Representative Background Sound Level (L_{A90}) dB	Ambient Sound Level (L_{Aeq}) dB
ID	**Day**	**Day**
ST1 (north of the Proposed Scheme)	65	70
ST2 (south-west of the Proposed Scheme)	35	50
ST3 (north of the Proposed Scheme)	39	51

7.7.5. The local noise environment is dominated by noise from the current operations at Drax Power Station, traffic using the wider road network and local farm machinery.

7.7.6. Further detail of the statistical analysis undertaken to determine the representative background sound results can be found in **Appendix 7.4 (Baseline Noise Statistical Analysis)** (document reference 6.3.7.4).

FUTURE BASELINE

7.7.7. Variations in the existing baseline conditions would depend on the local road network and any changes in the operation of Drax Power Station. It is expected that the baseline sound climate would not change significantly in the future.

7.7.8. The traffic data for the 2018 baseline and future baseline year 2029 have been compared. The BNL have been calculated in **Appendix 7.5 (Road Traffic Noise Assessment)** (document reference 6.3.7.5) at road links within the study area and the results indicate that there would be a negligible change in road traffic noise levels between these two years.

7.8. SENSITIVE RECEPTORS

7.8.1. Locations have been selected to assess the likely noise and vibration effects at sensitive receptors over the 2 km operational study area.

7.8.2. **Table 7.19** presents the list of representative assessment receptors, with a description and their OS coordinates. Sensitive receptor locations are shown in **Figure 7.1 (Baseline Noise Survey and Sensitive Receptor Locations)**. The table also shows the associated long term noise monitoring, location in brackets.

Table 7.19 - List of Sensitive Receptor Locations

ID	X	Y	Location Description
R1, Wren Hall (LT1)	467261.9	427158.7	Isolated residential receptor, east of Drax Power Station
R2, Long Drax (LT2)	468142	428087.1	Isolated residential receptor, north-east of Drax Power Station
R3, Old Lodge (LT3)	467515.79	428113.3	Isolated residential receptor, north-east of Drax Power Station
R4, Drax Abbey Farm (LT3)	467028.1	428280.2	Isolated residential receptor, north-east of Drax Power Station
R5, Foreman's Cottage (LT3)	466842.78	428479.71	Isolated residential receptor, north of Drax Power Station

ID	X	Y	Location Description
R6, 2 Forest Grove Barlow (LT4)	465215.3	428431.9	Sensitive residential receptors within the village of Barlow, north-west of Drax Power Station
R7, (Permanent Camblesforth)	465054.10	426248.03	Sensitive residential receptors within the village of Camblesforth, south-west of Drax Power Station
R8, Station Cottage, Hales Lane (LT6)	466994.3	426019.2	Isolated residential receptor, south-east of Drax Power Station
R9, Briden Bungalow (LT7)	467759.36	426857.68	Isolated residential receptor, east of Drax Power Station
R10, Weston House (LT7)	466922.76	426331.14	Sensitive residential receptors within the village of Drax, south-east of Drax Power Station
R11, Rose Cottage, Church Dike Lane (LT7)	468427.48	426135.35	Sensitive residential receptors in the vicinity (south) of Rose cottage, south-west of Drax Power Station
R12, Brigg Farm Court (LT5)	465206.3	426071.8	Sensitive residential receptors within the village of Camblesforth, south-west of Drax Power Station
R13, Camela House (Permanent Camblesforth)	464868.23	426604.69	Sensitive residential receptors in the vicinity (east) of Camela House, south-west of Drax Power Station
R14, Low Farm (LT4)	464211.46	427351.12	Sensitive residential receptors receptor, west of Drax Power Station

7.8.3. Locations for biodiversity receptors are presented in **Figure 7.2 (Biodiversity Noise Sensitive Receptor Locations)** (document reference 6.2.7.2) and **Appendix 7.6 (Biodiversity Receptor Modelling Results)** (document reference 6.3.7.6).

7.9. PRELIMINARY ASSESSMENT OF LIKELY IMPACTS AND EFFECTS

7.9.1. This section details the preliminary assessment of significant effects taking account of primary mitigation, as described in **Chapter 2 (Site and Project Description), and** paragraphs **7.5.47** and **7.5.48** but in the absence of secondary mitigation.

7.9.2. Noise predictions undertaken at biodiversity receptors for both construction and operational phases are presented in **Appendix 7.6 (Biodiversity Receptor Modelling Results)**. The assessment for these predictions is presented in section 8.8 and 8.11 of **Chapter 8 (Ecology)**.

CONSTRUCTION AND DECOMMISSIONING PHASES

7.9.3. The likely significant effects for Noise and Vibration associated with the construction and decommissioning phases are set out below.

7.9.4. **Table 7.20** and **Table 7.21** show the likely predicted noise levels at the nearest noise sensitive receptors as a result of all construction and decommissioning activities operating simultaneously, as a worst-case assessment in accordance with the method described in paragraph 7.5.28. The tables also show the measured ambient noise levels and the chosen ABC category, as described in Annex E (Informative) of BS5228-1:2009+A1:2014 – Code of practice for noise and vibration control on construction and open sites (British Standards Institute, 2009) .

Table 7.20 - Daytime Construction and Decommissioning Noise Levels at Sensitive Receptors

ID	Predicted All Construction Activities Noise Level dB $L_{Aeq,T}$	Measured Ambient Noise Level Day dB $L_{Aeq,T}$	ABC Category - Day
R1, Wren Hall (LT1)	28	63	B
R2, Long Drax (LT2)	25	55	A
R3, Old Lodge (LT3)	28	55	A
R4, Drax Abbey Farm (LT3)	31	49	A
R5, Foreman's Cottage (LT3)	31	49	A
R6, 2 Forest Grove Barlow (LT4)	32	51	A
R7, (Permanent Camblesforth)	29	54	A

ID	Predicted All Construction Activities Noise Level dB $L_{Aeq,T}$	Measured Ambient Noise Level Day dB $L_{Aeq,T}$	ABC Category - Day
R8, Station Cottage, Hales Lane (LT6)	22	54	A
R9, Briden Bungalow (LT7)	27	61	A
R10, Weston House (LT7)	20	61	A
R11, Rose Cottage, Church Dike Lane (LT7)	21	61	A
R12, Brigg Farm Court (LT5)	26	55	A
R13, Camela House (Permanent Camblesforth)	31	54	A
R14, Low Farm (LT4)	32	51	A

Table 7.21 - Night-time Construction and Decommissioning Noise Levels at Sensitive Receptors

ID	Predicted All Construction Activities Noise Level dB $L_{Aeq,T}$	Measured Ambient Noise Level Night dB $L_{Aeq,T}$	ABC Category - Night
R1, Wren Hall (LT1)	28	57	C
R2, Long Drax (LT2)	25	48	C
R3, Old Lodge (LT3)	28	48	C

ID	Predicted All Construction Activities Noise Level dB $L_{Aeq,T}$	Measured Ambient Noise Level Night dB $L_{Aeq,T}$	ABC Category - Night
R4, Drax Abbey Farm (LT3)	31	48	C
R5, Foreman's Cottage (LT3)	31	48	C
R6, 2 Forest Grove Barlow (LT4)	32	43	B
R7, (Permanent Camblesforth)	29	47	C
R8, Station Cottage, Hales Lane (LT6)	22	48	C
R9, Briden Bungalow (LT7)	27	44	B
R10, Weston House (LT7)	20	44	B
R11, Rose Cottage, Church Dike Lane (LT7)	21	44	B
R12, Brigg Farm Court (LT5)	26	44	B
R13, Camela House (Permanent Camblesforth)	31	47	C
R14, Low Farm (LT4)	32	43	B

7.9.5. The results in **Table 7.20** and **Table 7.21** show that the predicted noise levels at the nearest noise sensitive receptors are expected to be below the baseline ambient noise levels, and therefore, below the LOAEL which is described in paragraph **7.5.26**. Based on the criteria presented in **Table 7.9**, the magnitude of impact would be negligible. Therefore, the construction activity noise effect would be **not significant**.

7.9.6. **Table 7.22**, **Table 7.23** and **Table 7.24** show construction and decommissioning vibration assessment results based on vibration piling, percussive piling and vibratory compaction respectively and the likely peak particle velocity (PPV) at the nearest noise sensitive receptor, R1, Wren Hall.

Table 7.22 – BS5228 Vibratory Piling Assessment

Distance from Vibratory Piling Activity to R1, Wren Hall (m)	Scaling Factor (k_v)	Resultant PPV (mms^{-1})
900	126	0.1

Table 7.23 – BS5228 Percussive Piling Assessment

Distance from Percussive Piling Activity to R1, Wren Hall (m)	Nominal Hammer Energy (W)	Scaling Factor (k_p)	Resultant PPV (mms^{-1})
900	85000	3	0.1

Table 7.24 – BS5228 Vibratory Compaction Assessment

Distance from Vibratory Rollers and Compactors (m)	Max PPV (mms^{-1})	
	Vibratory Roller and Compactor Setting	
	Steady State	Start-up and Run Down
900	0.01	0.02

7.9.7. The results in **Table 7.22**, **Table 7.23** and **Table 7.24** show that the predicted vibration levels at the nearest sensitive receptor are expected to be below the LOAEL set for human vibration perception, which is more onerous than the criteria for buildings, as described in paragraph **7.5.31**. Based on the criteria for both humans and buildings presented in **Table 7.10** and **Table 7.11**, the magnitude of impact would be negligible. Therefore, the construction and decommissioning activity vibration effect would be **not significant**.

Construction and Decommissioning Traffic

7.9.8. The likely change in noise levels due to the generation of additional traffic movements during construction has been assessed. Guidance in DMRB LA111, short-term noise impact as presented in **Table 7.7**, has been followed for an assessment in the future year 2026.

7.9.9. The results of the assessment, which are provided in **Appendix 7.5 (Road Traffic Noise Assessment)**, indicate that traffic noise levels are likely to increase by up to 1 dB, which is classified as a minor magnitude of impact as described in **Table 7.7**. Therefore, the construction traffic noise effect would be **not significant**.

OPERATIONAL PHASE

7.9.10. The likely significant effects for noise associated with the operational phase are set out below.

Operational Noise Impact – Initial Estimate

7.9.11. **Table 7.25** and **Table 7.26** show the magnitude of operational noise impact on each representative sensitive receptor with reference to BS 4142:2014+A1:2019. The tables present the representative background noise levels associated with each noise sensitive receptor, the predicted specific noise level, as described in 7.5.50, and the predicted rating level, as described in paragraph **7.5.40**. The latter allows for a +5 dB correction to account for the potential of tonality and intermittency in the operational noise arising from the Proposed Scheme. The final column presents the difference between the rating level and the representative background noise level, to facilitate the initial estimate in accordance with BS 4142:2014+A1:2019.

7.9.12. **Figure 7.3 (Operational Predicted Mitigated Noise Levels)** presents the operational noise modelling results showing the specific noise level according to a colour coding described in the same figure.

Table 7.25 - Operational Noise Assessment - Daytime

ID	Background Noise Level, $L_{A90,15min}$ dB	Specific Noise Level, $L_{Aeq,1hr}$ dB	Predicted Rating Level, $L_{Ar,Tr}$ dB	Difference dB
R1, Wren Hall (LT1)	42	25	30	-12
R2, Long Drax (LT2)	34	20	25	-9
R3, Old Lodge (LT3)	34	19	24	-10

ID	Background Noise Level, $L_{A90,15min}$ dB	Specific Noise Level, $L_{Aeq,1hr}$ dB	Predicted Rating Level, $L_{Ar,Tr}$ dB	Difference dB
R4, Drax Abbey Farm (LT3)	41	21	26	-15
R5, Foreman's Cottage (LT3)	41	21	26	-15
R6, 2 Forest Grove Barlow (LT4)	34	29	34	0
R7, (Permanent Camblesforth)	42	28	33	-9
R8, Station Cottage, Hales Lane (LT6)	42	18	23	-19
R9, Briden Bungalow (LT7)	39	22	27	-12
R10, Weston House (LT7)	39	19	24	-15
R11, Rose Cottage, Church Dike Lane (LT7)	39	19	24	-15
R12, Brigg Farm Court (LT5)	37	19	24	-13
R13, Camela House (Permanent Camblesforth)	42	31	36	-6
R14, Low Farm (LT4)	34	30	35	1

7.9.13. Based on the initial estimate described in BS4142:2014+A1:2019, it is considered that the specific sound source having a low impact, depending on the context. Using **Table 7.12**, this equates to a negligible, minor and low magnitude of noise impact.

Table 7.26 - Operational Noise Assessment - Night-time

ID	Background Noise Level, $L_{A90,15min}$ dB	Specific Noise Level, $L_{Aeq,1hr}$ dB	Predicted Rating Level, $L_{Ar,Tr}$ dB	Difference dB
R1, Wren Hall (LT1)	42	25	30	-12
R2, Long Drax (LT2)	34	20	25	-9
R3, Old Lodge (LT3)	34	19	24	-10
R4, Drax Abbey Farm (LT3)	40	21	26	-14
R5, Foreman's Cottage (LT3)	40	21	26	-14
R6, 2 Forest Grove Barlow (LT4)	28	29	34	6
R7, (Permanent Camblesforth)	34	28	33	-1
R8, Station Cottage, Hales Lane (LT6)	31	18	23	-8
R9, Briden Bungalow (LT7)	29	22	27	-2
R10, Weston House (LT7)	29	19	24	-5
R11, Rose Cottage,	29	19	24	-5

ID	Background Noise Level, $L_{A90,15min}$ dB	Specific Noise Level, $L_{Aeq,1hr}$ dB	Predicted Rating Level, $L_{Ar,Tr}$ dB	Difference dB
Church Dike Lane (LT7)				
R12, Brigg Farm Court (LT5)	28	19	24	-4
R13, Camela House (Permanent Camblesforth)	34	31	36	2
R14, Low Farm (LT4)	28	30	35	7

7.9.14. Based on the initial estimate described in BS4142:2014+A1:2019, it is considered that the specific sound source having a low impact, depending on the context, at most noise sensitive receptors. Using **Table 7.12**, this equates to negligible or minor and low magnitude of noise impact. Results at noise sensitive receptors R6 (Barlow) and R14 (Low Farm) show that there is an indication of an adverse impact of moderate magnitude, depending on the context which is described in below.

Operational Noise Impact – Contextual Considerations

7.9.15. Contextual considerations have been taken into account include information relating to the likely change in ambient noise levels and further analysis on absolute noise levels and background noise levels.

7.9.16. **Table 7.27** and **Table 7.28** present the likely change in ambient noise levels expected when the Proposed Scheme is in operation. This is derived by logarithmically adding the measured noise levels to the specific sound source of the Proposed Scheme and then comparing the resulting value against the measured noise levels. It can be seen from both daytime and night-time comparisons, that the ambient noise levels would be dominated by the existing sound climate. Therefore, no change in ambient noise levels is expected due to the operation of the Proposed Scheme at any sensitive receptor.

Table 7.27 - Ambient Daytime Noise Assessment

ID	Predicted Noise Level, $L_{Aeq,T}$ dB	Measured Noise Level, $L_{Aeq,16h}$ dB	Predicted Noise Level + Measured Noise Level, $L_{Aeq,16h}$ dB	Difference dB
R1, Wren Hall (LT1)	25	63	63	0
R2, Long Drax (LT2)	20	55	55	0
R3, Old Lodge (LT3)	19	55	55	0
R4, Drax Abbey Farm (LT3)	21	49	49	0
R5, Foreman's Cottage (LT3)	21	49	49	0
R6, 2 Forest Grove Barlow (LT4)	29	51	51	0
R7, (Permanent Camblesforth)	28	54	54	0
R8, Station Cottage, Hales Lane (LT6)	18	54	54	0
R9, Briden Bungalow (LT7)	22	61	61	0
R10, Weston House (LT7)	19	61	61	0

ID	Predicted Noise Level, $L_{Aeq,T}$ dB	Measured Noise Level, $L_{Aeq,16h}$ dB	Predicted Noise Level + Measured Noise Level, $L_{Aeq,16h}$ dB	Difference dB
R11, Rose Cottage, Church Dike Lane (LT7)	19	61	61	0
R12, Brigg Farm Court (LT5)	19	55	55	0
R13, Camela House (Permanent Camblesforth)	31	54	54	0
R14, Low Farm (LT4)	30	51	51	0

Table 7.28 - Ambient Night-time Noise Assessment

ID	Predicted Noise Level, $L_{Aeq,T}$ dB	Measured Noise Level, $L_{Aeq,8h}$ dB	Predicted Noise Level + Measured Noise Level, $L_{Aeq,8h}$ dB	Difference dB
R1, Wren Hall (LT1)	25	57	57	0
R2, Long Drax (LT2)	20	48	48	0
R3, Old Lodge (LT3)	19	48	48	0
R4, Drax Abbey Farm (LT3)	21	48	48	0

ID	Predicted Noise Level, $L_{Aeq,T}$ dB	Measured Noise Level, $L_{Aeq,8h}$ dB	Predicted Noise Level + Measured Noise Level, $L_{Aeq,8h}$ dB	Difference dB
R5, Foreman's Cottage (LT3)	21	48	48	0
R6, 2 Forest Grove Barlow (LT4)	29	43	43	0
R7, (Permanent Camblesforth)	28	47	47	0
R8, Station Cottage, Hales Lane (LT6)	18	48	48	0
R9, Briden Bungalow (LT7)	22	44	44	0
R10, Weston House (LT7)	19	44	44	0
R11, Rose Cottage, Church Dike Lane (LT7)	19	44	44	0
R12, Brigg Farm Court (LT5)	19	44	44	0
R13, Camela House (Permanent Camblesforth)	31	47	47	0
R14, Low Farm (LT4)	30	43	43	0

7.9.17. Secondly, absolute noise levels have been assessed against guidance in Section 7.7 Specific Types of Buildings in BS8233:2014 (British Standards Instituite, 2014). Predicted noise levels at R13 are the highest noise modelling results, therefore, these levels have been used as a worst-case assessment against BS8233 internal night-time guideline values within bedrooms described in **Table 7.29**. Results have also been compared against NR25 curve, in **Table 7.30**, also representative of guideline values for night-time within bedrooms across octave bands frequencies, based on the approximation described in BS8233 Annex B (Informative). The tables assume a noise reduction through a partially open window of 15 dB accordance with advice in BS8233.

Table 7.29 – R13 - Night-time Internal Noise Level Assessment

Predicted Noise Level, $L_{Aeq,T}$ dB	Open Window Attenuation dB	Internal Noise Level $L_{Aeq,8h}$ dB	BS8233 Night Bedroom $L_{Aeq,8h}$ dB
31	15	16	30

Table 7.30 – R13 - NR 25 Curve Night-time Noise Level Assessment

	Octave Band Frequency $L_{eq,8h}$ dB							
	63 Hz	**125 Hz**	**250 Hz**	**500 Hz**	**1000 Hz**	**2000 Hz**	**4000 Hz**	**8000 Hz**
Outdoor Noise Levels	39	37	38	26	17	3	0	0
Open Window Attenuation	15	15	15	15	10	15	15	15
Internal Noise Level	22	22	22	8	5	5	5	5
Noise Rating 25 Curve	55	44	35	29	25	22	20	18

7.9.18. Results in **Table 7.29** and **Table 7.30** show that internal noise levels at R13 are predicted to be below guideline values during the night-time. For instance, the internal noise level in **Table 7.29** Table 7.29is predicted to be lower than the guideline value for bedrooms of 30 dB $L_{Aeq,8h}$. Similarly, the internal noise levels presented in **Table 7.30** are lower than the noise levels on Noise Rating 25 curve at any octave frequency band.

7.9.19. Finally, further analysis has been undertaken on the background noise monitoring undertaken by the Applicant. The conclusions of this analysis are summarised below:

a. The initial estimate for the operational noise assessment is based on the background noise levels recorded during 30% of the measurement period. This means that, approximately 70% of the time, the background noise levels are likely to be higher than those selected for this assessment. The conclusions related to operational noise in this chapter are based on a reasonably worst-case assessment; and

b. Permanent noise monitoring undertaken by the Applicant during three months in 2020 indicate that the background noise levels are generally higher than those selected for this assessment. Statistical analysis for the data collected in 2020 at Camblesforth and Barlow is presented in **Appendix 7.4 (Baseline Noise Statistical Analysis)**.

7.9.20. The initial estimate combined with the contextual considerations demonstrates that the operational noise effect due to operation of the post combustion carbon capture technology would be **not significant**.

Operational Traffic

7.9.21. The likely change in noise levels due to the additional generation of traffic movements during operation has been assessed. Guidance in DMRB LA111, short-term noise impact, has been followed for an assessment in the future year 2029.

7.9.22. The results of the assessment, in **Appendix 7.5 (Road Traffic Noise Assessment)**, indicate that traffic noise levels are unlikely to change. Therefore, the operational traffic noise effect would be **not significant**.

Significance of Effects

7.9.23. Based on the magnitude of impacts described in this section, the following effects are expected:

a. The construction and decommissioning noise and vibration effects are expected to be **not significant**; and

b. The operational noise effects are expected to be **not significant**.

7.10. DESIGN, MITIGATION AND ENHANCEMENT MEASURES

7.10.1. No significant effects have been identified for the Proposed Scheme and as a result no design, mitigation or enhancement measures are proposed.

7.11. ASSESSMENT OF LIKELY SIGNIFICANT EFFECTS

7.11.1. As described in **section 7.9 (Preliminary Assessment of Likely Impacts and Effects)**, **no significant environmental effects** for noise have been identified.

7.12. CUMULATIVE EFFECTS

7.12.1. An assessment of intra-project combined effects and inter-project cumulative effects for noise and vibration has been carried out and is presented in **Chapter 18 (Cumulative Effects)** of this ES (document reference 6.1.18). Furthermore, the traffic noise assessment undertaken in this chapter correspond to a cumulative assessment for those years.

7.13. IN-COMBINATION CLIMATE CHANGE IMPACTS

7.13.0. The in-combination climate change impact assessment considers the extent to which climate change may alter the effects which have already been identified within this chapter.

7.13.1. The effects that have been considered within this chapter have been assessed against likely climate hazards, as set out within **Chapter 14 (Climate Change Resilience)** of this ES (document reference 6.1.14), and the effects identified are not anticipated to change as a result of these hazards.

7.14. MONITORING

7.14.1. Based on the conclusions in this chapter, the following monitoring should be carried out:

a. Noise monitoring during the construction phase at locations representative of sensitive receptors R1, R4 and R13, shown in **Figure 7.1 (Baseline Noise Survey and Sensitive Receptor Locations),** to demonstrate that the noise levels do not exceed the SOAEL for construction; and

b. Noise monitoring during operation at locations stipulated in the noise mitigation scheme secured through a DCO requirement.

Table 7.31 - Summary of Noise and Vibration Effects

Receptor	Potential Effects	Additional Mitigation	Residual Effects
Noise sensitive receptors surrounding the Order Limits, including isolated properties and the villages Camblesforth, Barlow and Drax.	Likely noise effects arising from the Proposed Scheme construction traffic	No additional mitigation measures other than those considered as primary mitigation.	**Not significant** T / I / ST
Noise sensitive receptors surrounding the Order Limits, including isolated properties and the villages Camblesforth, Barlow and Drax.	Likely noise effects arising from the construction and decommissioning activities	No additional mitigation measures other than those considered as primary mitigation.	**Not significant** T / I / ST
Nearest vibration sensitive receptor north of the Proposed Scheme	Likely vibration effects arising from the construction and decommissioning activities	No additional mitigation measures other than those considered as primary mitigation.	**Not significant** T / I / ST
Noise sensitive receptors surrounding the Order Limits, including isolated properties and the villages Camblesforth, Barlow and Drax.	Likely noise effects arising from the Proposed Scheme operational traffic	No additional mitigation measures other than those considered as primary mitigation.	**Not significant** P / I / LT
Noise sensitive receptors surrounding the Order Limits, including isolated properties and the villages Camblesforth, Barlow and Drax.	Likely noise effects arising from the Proposed Scheme operation of the post combustion carbon capture technology	No additional mitigation measures other than those considered as primary mitigation.	**Not significant** P / I / LT

Key to table:

P/T = Permanent or Temporary, D/I = Direct or Indirect, ST/MT/LT = Short Term, Medium Term or Long Term, N/A = Not Applicable

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