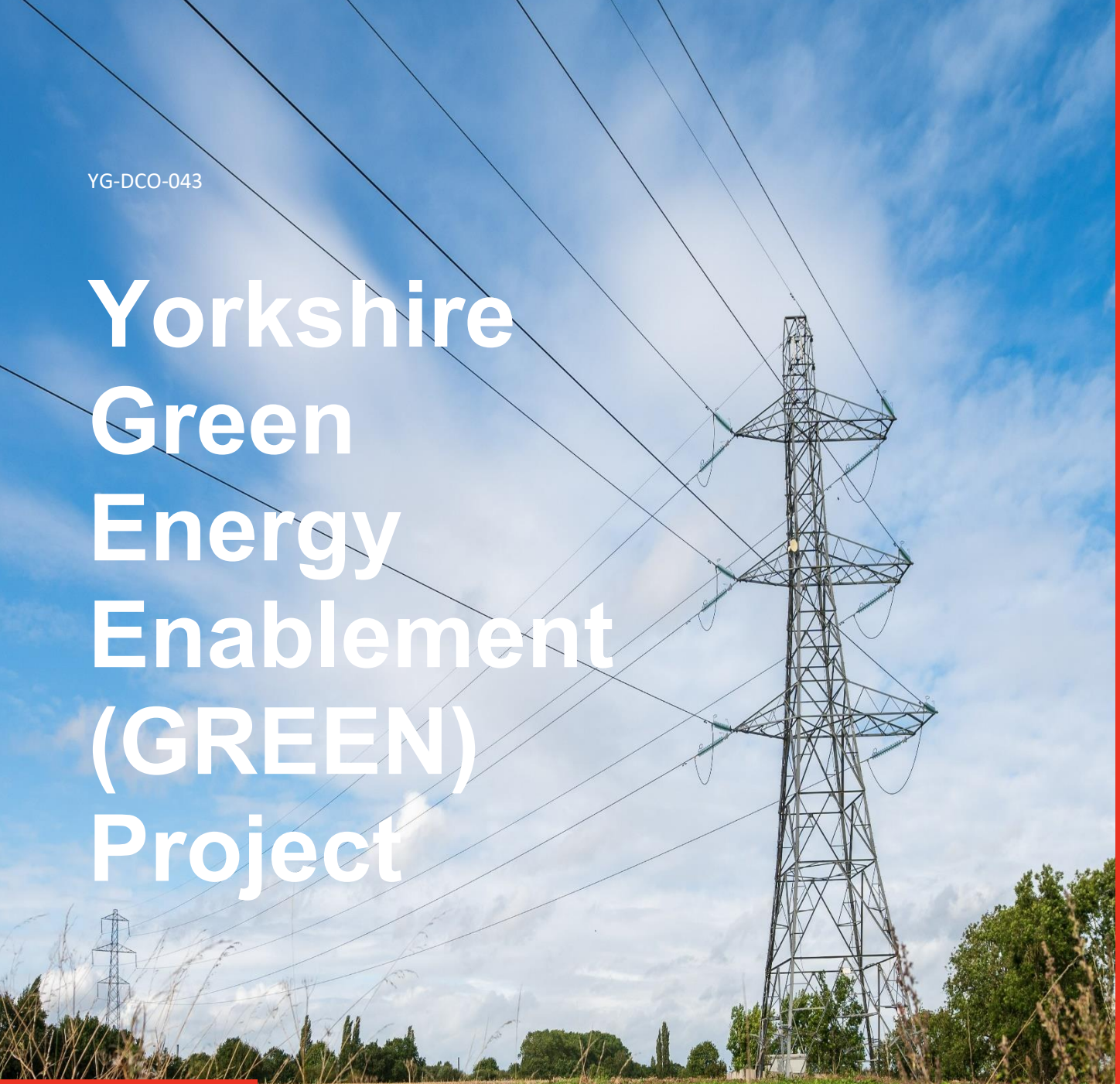
YG-DCO-043

Yorkshire Green Energy Enablement (GREEN) Project



Volume 5

Document 5.2.14 ES Chapter 14: Noise and Vibration

Final Issue A

November 2022

Planning Inspectorate Reference: EN020024

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

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Version history			
Date	**Version**	**Status**	**Description/changes**
01/11/2022	A	Final	First Issue

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14. Noise and Vibration

14.1 Introduction

14.1.1 This chapter presents the assessment of the likely significant effects of the Yorkshire Green Energy Enablement (GREEN) Project ("the Project" or "Yorkshire GREEN") with respect to noise and vibration. It should be read in conjunction with the Project description provided in **Chapter 3: Description of the Project, Volume 5, Document 5.2.3**, the Figures (**Volume 5, Document 5.4.14**) and Appendices referred to in this text (**Appendices 5.3.14A – 5.3.14H, Volume 5, Documents 5.3.14A to 5.3.14H**), and with respect to relevant parts of the following chapters:

- **Chapter 6: Landscape and Visual Amenity, Volume 5, Document 5.2.6** (environmental measures required to reduce noise effects during both the construction phase and operational phase potentially resulting in visual effects for sensitive receptors);
- **Chapter 8: Biodiversity, Volume 5, Document 5.2.8** (all phases of the Project potentially resulting in noise and vibration effects on ecological resources);
- **Chapter 12: Traffic and Transport, Volume 5, Document 5.2.12** (the noise assessments rely on traffic flows to predict changes in traffic noise level); and
- **Chapter 7: Historic Environment, Volume 5, Document 5.2.7** (the historic environment is considered a sensitive resource that could potentially be affected by noise and vibration from the Project).

14.1.2 This chapter describes:

- introduction to the Project, and sources of noise and vibration (**Section 14.1**);
- the legislation, policy and technical guidance that has informed the assessment (**Section 14.2**);
- consultation and engagement that has been undertaken and how comments from consultees relating to noise and vibration have been addressed (**Section 14.3**);
- the methods used for baseline data gathering (**Section 14.4**);
- overall baseline (**Section 14.5**);
- embedded environmental measures relevant to noise and vibration (**Section 14.6**);
- the scope of the assessment for noise and vibration (**Section 14.7**);
- the methods used for the assessment (**Section 14.8**);
- the assessment of noise and vibration effects (**Section 14.9**);
- assessment of cumulative (intra- and inter-project) effects (**Section 14.10**); and
- a summary of the significance conclusions (**Section 14.11**).

14.1.3 The appendices are:

- Baseline Noise Monitoring Report (**Appendix 5.3.14A, Volume 5, Document 5.3.14A**);
- Construction plant and activity assumptions (**Appendix 5.3.14B, Volume 5, Document 5.3.14B**);
- Construction modelling results (**Appendix 5.3.14C, Volume 5, Document 5.3.14C**);
- Construction noise screening (**Appendix 5.3.14D, Volume 5, Document 5.3.14D**);
- Overhead line noise methodology and assessment (**Appendix 5.3.14E, Volume 5, Document 5.3.14E**); and
- National Grid Electricity Transmission plc ("National Grid") overhead line noise Policy and Technical Documents (**Appendices 5.3.14F – 5.3.14H, Volume 5, Documents 5.3.14F – 5.3.14H**).

14.1.4 The Noise and Vibration Management Plan is also provided as **Appendix 5.3.3H** (**Volume 5, Document 5.3.3H**) to **Chapter 3** (Volume 5, **Document 5.2.3**) of the ES.

Project overview

14.1.5 The Project is divided into six sections for ease of reference as indicated in **Figure 1.2**, **Volume 5, Document 5.4.1**. The Project will comprise both new infrastructure and works to existing transmission infrastructure and facilities as follows.

14.1.6 Section A (Osbaldwick Substation): Minor works at the existing Osbaldwick Substation comprising the installation of a new circuit breaker and isolator along with associated cabling, removal and replacement of one gantry and works to one existing pylon. All substation works would be within existing operational land.

14.1.7 Section B (North west of York Area): Works would comprise:

- reconductoring of 2.4km of the 400kV Norton to Osbaldwick (2TW/YR) overhead line and replacement of one pylon on this overhead line;
- the new 400kV YN overhead line (2.8km), north of the proposed Overton Substation;
- the new Shipton North and South 400kV cable sealing end compounds (CSECs) and 230m of cabling to facilitate the connection of the new YN 400kV overhead line with the existing Norton to Osbaldwick YR overhead line;
- a new substation (Overton 400kV/275kV Substation) approximately 1km south of Shipton by Beningbrough;
- two new sections of 275kV overhead line which would connect into Overton Substation from the south (the 2.1km XC overhead line to the south-west and the 1.5km SP overhead line to the south-east);
- works to 5km of the existing XCP Poppleton to Monk Fryston overhead line between Moor Monkton in the west and Skelton in the east comprising a mixture of decommissioning, replacement and realignment. To the south and south-east of Moor Monkton the existing overhead line would be realigned up to 230m south from the current overhead line and the closest pylon to Moor Monkton (340m south-east) would be permanently removed. A 2.35km section of this existing overhead line permanently removed between the East Coast Mainline (ECML) Railway and Woodhouse Farm to the north of Overton.

14.1.8 Section C (Moor Monkton to Tadcaster): Works proposed to the existing 275kV Poppleton to Monk Fryston (XC) overhead line comprise replacing existing overhead line conductors, replacement of pylon fittings, strengthening of steelwork and works to pylon foundations.

14.1.9 Section D (Tadcaster Area): Two new CSECs (Tadcaster East and West 275kV CSECs) and approximately 350m of cable would be installed approximately 3km south-west of Tadcaster and north-east of the A64/A659 junction where two existing overhead lines meet. One pylon on the existing 275kV Tadcaster Tee to Knaresborough (XD) overhead line would be replaced.

14.1.10 Section E (Tadcaster to Monk Fryston): Works proposed to the existing 275kV Poppleton to Monk Fryston (XC) overhead line would comprise replacing existing overhead line conductors, replacement of pylon fittings, strengthening of steelwork and works to pylon foundations.

14.1.11 Section F (Monk Fryston Area): A new substation would be constructed to the east of the existing Monk Fryston Substation which is located approximately 2km south-west of the village of Monk Fryston and located off Rawfield Lane, south of the A63. A 1.45km section of the 275kV Poppleton to Monk Fryston (XC) overhead line to the west of the existing Monk Fryston Substation and south of Pollums House Farm would be realigned to connect to the proposed Monk Fryston Substation. East of the existing Monk Fryston Substation the existing 4YS 400kV Monk Fryston to Eggborough overhead line, which currently connects to the existing substation, would be reconfigured to connect to the proposed Monk Fryston Substation.

14.1.12 Please refer to **Chapter 3: Description of the Project, Volume 5, Document 5.2.3** and **Figures 1.1** and **1.2, Volume 5, Document 5.4.1** for an overview of the different components of the Project.

Limitations and assumptions

14.1.13 This chapter has been produced to assess the likely significant effects of the Project with regard to noise and vibration and should be read in conjunction with the project description in **Chapter 3: Description of the Project, Volume 5, Document 5.2.3** and the Figures and Appendices referred to in this text (**Appendix 5.3.14A – 5.3.14H, Volume 5, Documents 5.3.14A – 5.3.14H**).

14.1.14 The Project has been based on the principle that measures have been 'embedded' into the Project design to avoid potential significant effects (**Section 4.6, Chapter 4, Volume 5, Document 5.2.4**). This approach is informed by the iterative design process. The Project would ensure that standard good practice construction measures are adopted, through the implementation of a Code of Construction Practice (CoCP) (**Appendix 5.3.3B, Volume 5, Document 5.3.3B**). The appraisal of potential effects therefore assumes that both design mitigation and good practice measures are in place.

14.2 Relevant legislation, planning policy and technical guidance

14.2.1 This section identifies the legislation, planning policy and technical guidance that has informed the assessment of effects with respect to noise and vibration. Further information on policies relevant to the Project is provided in **Chapter 5: Legislation and Policy Overview, Volume 5, Document 5.2.5**.

Legislation

14.2.2 A summary of the relevant legislation is given in **Table 14.1**.

Table 14.1 – Legislation relevant to the noise and vibration assessment

Legislation	Legislative Context
The Environmental Protection Act 1990[1] (as amended by the Noise and Statutory Nuisance Act 1993[2]) (particularly Section 79) (EPA)	The EPA sets out: the definition of statutory nuisance due to noise; the duty on local authorities to investigate and abate nuisance; and the defence against abatement because "best practicable means" has been employed to minimise noise (including vibration) for business premises. The EPA sets out the means for a person affected by noise nuisance to seek abatement through the courts. The Noise and Statutory Nuisance Act sets out an extension of powers to abate noise nuisance to a wider range of sources than the Environmental Protection Act 1990.
The Control of Pollution Act 1974 (particularly Sections 60 and 61) (CoPA)[3]	Sets out the Section 60 notice which a local authority can serve so as to impose requirements upon relevant construction activities with regard to the control of noise. Under Section 61 of the CoPA, the party that intends to carry out works to which Section 60 applies may apply to the local authority for consent and *"an application under this section shall contain particulars of –* *The works, and method by which they are to be carried out; and* *The steps proposed to be taken to minimise noise resulting from the works."*
Planning Act 2008 ("the Act")[4]	In respect of noise nuisance, the Act confers statutory authority unless there is a provision in a granted Development Consent Order (DCO) to the contrary.

Planning policy

14.2.3 A summary of the relevant national and local planning policy is given in **Table 14.2**. In September 2021, the Department of Business, Energy and Industrial Strategy (BEIS) consulted upon a review of energy National Policy Statements (NPS) with consultation closing on 29 November 2021. The energy NPS were reviewed to reflect the policies

[1] UK Government (1990). The Environmental Protection Act 1990. (online). Available at: https://www.legislation.gov.uk/ukpga/1990/43/contents/made (Accessed 16 February 2021)
[2] UK Government (1993). Noise and Statutory Nuisance Act 1993. (online). Available at: https://www.legislation.gov.uk/ukpga/1993/40/contents/made (Accessed 16 February 2021)
[3] UK Government (1974). The Control of Pollution Act 1974. (online). Available at https://www.legislation.gov.uk/ukpga/1974/40/contents/made (Accessed 16 February 2021).
[4] UK Government (2008). Planning Act 2008. (online). Available at: https://www.legislation.gov.uk/ukpga/2008/29/contents/made (Accessed 16 February 2021).

and broader strategic approach set out in the Energy White Paper[5] and ensure a planning framework was in place to support the infrastructure requirement for the transition to net zero. There are no substantive changes with regard to noise and vibration within those draft Energy National Policy Statements, with the exception of Draft EN-5, explained in **Table 14.2**, which are considered to be relevant to the Project.

Table 14.2 – Planning policy relevant to the noise and vibration assessment

Policy	Policy Context
National planning policy	
Overarching National Policy Statement for Energy (EN-1)[6]	Section 5.11: Sets out how noise should be assessed where noise impacts are likely to arise from the Project. EN-1 refers to the relevant British Standards for the assessment of operational noise and construction noise (where 'noise' is used as an umbrella term for noise and vibration) and refers to further information provided in the technology specific National Policy Statements e.g., EN-5[7] Paragraph 5.11.8 requires applicants to demonstrate good design through measures such as selection of the quietest cost-effective plant; containment of noise within buildings; optimisation of plant layout to minimise noise emissions; and the use of landscaping, bunds or noise barriers to reduce noise transmission. Paragraph 5.11.9 states that the Secretary of State (SoS) should not grant development consent unless it is satisfied that the proposals will meet the three aims of the Noise Policy Statement for England (NPSE)[7] Paragraph 5.11.12 sets out potential mitigation measures. **This is addressed in Section 14.8 of this Chapter.**
National Policy Statement for Electricity Networks Infrastructure (EN-5)[8]	Section 2.9 provides details specific considerations for the assessment of noise from high voltage transmission lines as they have the potential to generate noise under certain conditions, known as 'corona discharge' and caused when the conductor

[5] Secretary of State for Business, Energy and Industrial Strategy (2020). The Energy White Paper Powering our Net Zero Future. (online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/945899/201216_BEIS_EWP_Command_Paper_Accessible.pdf (Accessed 24 October 2022).
[6] Department of Energy and Climate Change (2011). Overarching National Policy Statement for Energy (EN-1). (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47854/1938-overarching-nps-for-energy-en1.pdf (Accessed 25 August 2021).
[7] DEFRA (2010). Noise Policy Statement for England (NPSE). (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/69533/pb13750-noise-policy.pdf (Accessed 25 August 2021).
[8] Department of Energy and Climate Change (2011). National Policy Statement for Electricity Networks Infrastructure (EN-5). (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/37050/1942-national-policy-statement-electricity-networks.pdf (Accessed 31 March 2021).

Policy	Policy Context
	surface voltage gradient (electrical stress) threshold is exceeded. Generally, transmission line conductors are designed to be operated below this threshold but there are a number of factors which can lead the threshold to be exceeded, such as: • accidental damage to transmission lines; • wet or humid weather conditions; and • the accumulations of surface contaminants. EN-5 requires that the noise assessment method addresses these particular issues and in particular considers the effect of rain on operational noise effects. **This is addressed in Section 14.8 of this Chapter.**
Draft National Policy Statement for Electricity Networks Infrastructure (EN-5)[9]	Section 2.12.9 of the Draft Statement identifies that the assessment of overhead line noise needs to consider wet and dry noise. This assessment complies with this requirement through the use of the screening and assessment tools provided in **Appendix 5.3.14F – 5.3.14H** (**Volume 5, Documents 5.3.14F – 5.3.14H**). The Draft Statement confirms the appropriate assessment tool for substation noise is British Standard 4142:2014 + A1:2019. The assessment is undertaken in accordance with this. The Draft Statement provides mitigation measures that must be considered, these are included as embedded mitigation.
National Planning Policy Framework (NPPF)[10]	Paragraph 174 states that the planning system should contribute to and enhance the natural and local environment by (amongst other considerations) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution. Paragraph 185 states that planning policies and decisions should ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution. This involves, in particular, mitigating and reducing to a minimum, potential adverse impacts resulting from noise; avoiding noise that gives rise to significant adverse impacts on health and the quality of life. In addition, tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value should be identified and protected. Paragraph 187 states that planning policies and decisions should ensure that new development can be integrated effectively with existing business and community facilities, with existing businesses

[9] Department for Business, Energy & Industrial Strategy (2021). Draft National Policy Statement for Electricity Networks Infrastructure (EN-5). (online) Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015238/en-5-draft-for-consultation.pdf (Accessed 25 October 2022).

[10] Ministry of Housing, Communities & Local Government (2021). National Planning Policy Framework. (online). Available at: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1005759/NPPF_July_2021.pdf (Accessed 25 August 2021).

Policy	Policy Context
	not having unreasonable restrictions placed on them as a result of new development permitted after the business was established. Where the operation of an existing business or community facility could have a significant adverse effect on a new development, the application should provide suitable mitigation before the development is complete. This should be taken into account when considering whether proposed development is an acceptable use of land. **This is addressed in Section 14.5 of this Chapter.**
Noise Policy Statement for England (NPSE)[7]	Paragraph 1.6 sets out the long-term vision of Government noise policy, i.e. to "*promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.*" Paragraph 1.7 states that the NPSE vision is supported by aims to effectively manage and control environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development by avoiding significant adverse impacts, mitigating and minimising adverse impacts and contributing to the improvement of health and quality of life. Paragraph 2.20 states that to identify "significant adverse" and "adverse" impact in line with the three aims of NPSE, there are two established concepts from toxicology that are currently being applied to noise impacts, for example, by the World Health Organization: No Observed Effect Level (NOEL): This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise. Lowest Observed Adverse Effect Level (LOAEL): This is the level above which adverse effects on health and quality of life can be detected. Significant Observed Adverse Effect Level (SOAEL). This is the level above which significant adverse effects on health and quality of life occur. Paragraph 2.24 states that where an impact lies somewhere between LOAEL and SOAEL, all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur. Paragraph 2.22 notes that the NPSE states "*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*

Policy	Policy Context
	specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."
Planning Practice Guidance - Noise[11] (PPG-N)	The PPG-N provides guidance in the form of a noise exposure hierarchy, which details the levels of perception to noise exposure and the expected outcomes and required actions. **This is addressed in Section 14.8 of this Chapter.**
Local planning policy	
Selby District Local Plan, 2005[12]	Policy ENV2A: Environmental Pollution and Contaminated Land "*Proposals for development which would give rise to, or would be affected by, unacceptable levels of noise, … 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.*"
Selby District Core Strategy Local Plan, 2013[13]	Policy SP17: Low carbon and renewable energy Infrastructure supporting development proposals for new sources of renewable energy and low-carbon energy generation must be designed and located to protect the environment and local amenity or demonstrate that the wider environmental, economic and social benefits outweigh any harm caused to the environment and local amenity and minimise impacts on local communities. Policy SP19: Design quality Proposals will be expected to have regard to the local character, identity and context of its surroundings and should prevent development from contributing to or being put at unacceptable risk from or being adversely affected by unacceptable levels of noise pollution.
Selby Draft Local Plan – Preferred options, 2021[14]	Preferred Approach SG9: Design of new development Proposals should protect residential amenity by ensuring proposals do not have adverse impact from disturbance from noise or vibration. Preferred Approach NE9: Pollution and contaminated land

[11] Ministry of Housing, Communities & Local Government (2019). Planning Practice Guidance – Noise. (online). Available at: https://www.gov.uk/ guidance/noise--2 (Accessed 25 August 2021).
[12] Selby District Council (2005). Selby District Local Plan Adopted February 2005 Part 1 – General Policies. (online). Available at: https://www.selby.gov.uk/sites/default/files/Documents/local_plan_chapter4.pdf (Accessed 25 August 2021).
[13] Selby District Council (2013). Selby District Core Strategy Local Plan. (online). Available at: https://www.selby.gov.uk/sites/default/files/Documents/CS_Adoption_Ver_OCT_2013_REDUCED.pdf (Accessed 25 August 2021).
[14] Selby District Council (2021). Selby District Council Local Plan Preferred Options Consultation 2021. (online). Available at: https://www.selby.gov.uk/sites/default/files/Local_Plan_Preferred_Options_29-01-2021_%28Web%20Version%29.pdf (Accessed 25 August 2021).

Policy	Policy Context
	Proposals which could give rise to, or would be affected by, noise pollution will not be permitted unless satisfactory remedial or preventative measures are incorporated as an integral element in the scheme before the use of the site commences.
Leeds City Council Saved UDP Review, 2006[15]	Policy N49: Protection Design of new development, including landscaping, should minimise its potential adverse impact.
Saved Policies of the York Local Plan, 2005[16]	Policy GP1: Design Development proposals will be expected to ensure that residents living nearby are not unduly affected by noise or, disturbance. Policy GP4a: Sustainability Development should minimise pollution, including that relating to noise. Policy E7: B1 Office Development in Existing Buildings Development which would give rise to substantially increased levels of noise will normally not be permitted, but the expansion of existing industry or processing or other established industries in north Yorkshire may be allowed.
City of York draft Local Plan – Publication Draft, 2018[17]	Policy DP2: Sustainable Development Development will help conserve and enhance the environment through limiting environmental nuisance including noise, and vibration emissions. Policy CC1: Renewable and Low Carbon Energy Generation and Storage Renewable and low carbon energy generation developments will be encouraged and supported and will need to consider the impact the scheme may have on local communities and residential amenity resulting from development, construction and operation such as noise. Policy ENV2: Managing Environmental Quality Development will not be permitted where future occupiers and existing communities would be subject to significant adverse noise, vibration or fumes/emissions impacts without effective mitigation measures. Such proposals must be accompanied by evidence that the impacts have been evaluated and the proposal will not result in

[15] Leeds City Council (2006). Leeds Unitary Development Plan (Review 2006). (online) Available at: https://www.leeds.gov.uk/docs/FPI_UDP_001%20Volumen%201%20Written%20Statement.pdf (Accessed 25 August 2021).

[16] City of York (2005). City of York Draft Local Plan Incorporating the 4th Set of Changes. (online). Available at: https://www.york.gov.uk/ downloads/file/2822/the-local-plan-2005-development-control-local-plan-full-document-and-appendices (Accessed 25 August 2021).

[17] City of York (2018). City of York – Local Plan – Publication Draft – February 2018. (online). Available at: https://www.york.gov.uk/ downloads/file/1314/cd001-city-of-york-local-plan-publication-draft-regulation-19-consultation-february-2018- (Accessed 25 August 2021).

Policy	Policy Context
	loss of amenity or damage to human health, to either existing or new communities.
City of York draft Local Plan – Publication Draft, 2018[18]	Policy D1: Placemaking Ensure design considers residential amenity so that residents living nearby are not unduly affected by noise or disturbance.
Upper Poppleton and Nether Poppleton Neighbourhood Plan, 2016-2036[19]	Makes reference to Section 109 of the NPPF which requires the planning system to contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by, unacceptable levels of noise pollution. This is now Section 174 in the July 2021 revision of NPPF[8]
Harrogate District Local Plan, 2014-2035[20]	Policy HP4: Protecting Amenity Proposals should be designed to ensure that they will not result in significant adverse impacts on the amenity of occupiers and neighbours, including from vibration, noise and other disturbance. The individual and cumulative impacts of development proposals on amenity will be considered.
Hambleton Local Plan – Adopted February 2022[21]	Policy S1: Sustainable Development Principles Provides support for proposals where they promote and encourage or protect and enhance the health, economic and social well-being, amenity and safety of the population. Policy E2: Amenity "*All proposals will be expected to provide and maintain a high standard of amenity for all users and occupiers, including both future occupants and users of the proposed development as well as existing occupants and users of neighbouring land and buildings, in particular those in residential use. A proposal will therefore be required to ensure:* *…* *c. there are no significant adverse impacts in terms of noise (particularly with regards to noise sensitive uses and noise*

[18] City of York (2019). City of York – Local Plan – Proposed Modifications – June 2019. (online). Available at: https://www.york.gov.uk/ downloads/file/1828/ex-cyc-20-proposed-modifications-june-2019 (Accessed 25 August 2021).
[19] City of York Council (2017). Upper Poppleton and Nether Poppleton Neighbourhood Plan, 2016 – 2036. (online) Available at: https://www.york.gov.uk/downloads/file/2832/upper-and-nether-poppleton-neighbourhood-plan-submission-document-2016- (Accessed 15 February 2021).
[20] Harrogate Borough Council (2020). Harrogate Borough Council Local Plan 2014 – 2035. (online). Available at: https://www.harrogate.gov.uk/ downloads/file/1937/heritage-and-placemaking-and-natural-environment-chapters-8-and-9 (Accessed 25 August 2021).
[21] Hambleton District Council (2022). Hambleton Local Plan Adopted February 2022. (online) Available at: https://www.hambleton.gov.uk/downloads/file/2745/hambleton-local-plan-final-february-2022 (Accessed 25 October 2022).

Policy	Policy Context
	designations), including internal and external levels, timing, duration and character; *…* *Where mitigation is necessary to ensure that the above requirements are met their compatibility with all other relevant policy requirements will be considered when determining the acceptability of the proposal.*"

Technical guidance

14.2.4 A summary of the technical guidance for noise and vibration is given in **Table 14.3**.

Table 14.3 – Technical guidance relevant to the noise and vibration assessment

Technical Guidance Document	Context
Institute of Environmental Management and Assessment (IEMA) (2014) Guidelines for Environmental Noise Impact Assessment[22]	Presents guidelines on how the assessment of noise effects should be presented within the Environmental Impact Assessment (EIA) process. The IEMA guidelines cover aspects such as: scoping, baseline, prediction and example definitions of significance criteria.
BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Noise (BS 5228-1)[23]	Provides guidance on the assessment and control of noise from construction sites, along with suggestions for the derivation of guideline levels for impact assessment.
BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Vibration (BS 5228-2)[24]	Provides guidance on the assessment and control of vibration from construction sites, along with suggestions for the derivation of guideline vibration levels.
BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration (BS 7385-2)[25]	Guidance on the levels of groundborne vibration which could have the potential to lead to the damage of building structures.

[22] Institute of Environmental Management and Assessment (2014). Guidelines for Environmental Noise Impact Assessment. IEMA, London.
[23] British Standards Institute (2014). BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 1 - Noise. BSI, London.
[24] British Standards Institute (2014). BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites. Part 2 - Vibration. BSI, London.
[25] British Standards Institute (1993). BS 7385-2:1993 Evaluation and measurement for vibration in buildings. Guide to damage levels from groundborne vibration. BSI, London.

Technical Guidance Document	Context
BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound[26]	The standard is used to rate and assess sound of an industrial nature including, but not limited to, assessing sound from proposed, new, modified or additional sources of industrial sound, and sound at proposed new dwellings. It contains guidance on the monitoring and assessment of industrial and commercial sound sources (including fixed installations comprising mechanical and electrical plant and equipment) affecting sensitive receptors.
ISO 9613:1996 Acoustics – Attenuation of sound during propagation outdoors: Part 2 General Method of Calculation (ISO 9613-2)[27]	Defines a method for calculating the attenuation of sound during propagation outdoors in order to predict the levels of environmental noise at distances from a source.
Technical Report TR(T)94 (1993) A Method for Assessing the Community Response to Overhead Line Noise[28] (Withdrawn)	Now withdrawn; the general approach is still followed but the specific methods have now been superseded. Describes a methodology for the assessment of operational noise due to overhead power lines accounting for the effects of corona discharge which occurs when there is increased electrical surface stress on the conductor such as during wet weather conditions. The approach followed the principles of BS 4142:1990 but took into account the following factors: local ground conditions; the rainfall rate probability; the effect of rate of rainfall on background sound levels; rain-induced operational noise; and low frequency noise.
National Grid Policy Statement PS(T)134 (2021) Operational Audible Noise Policy for Overhead Lines[29]	Applies to environmental noise due to the operation of new overhead power lines, reconductoring, diversion and uprating projects for overhead lines operated at 275kV and 400kV. The policy describes a three-tier assessment process and sets noise impact criteria taking into account worst-case wet noise (Tier 1), wet noise and dry noise in combination (Tier 2), and dry noise and wet noise

[26] British Standards Institute (2019). BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound. BSI, London.
[27] International Organization for Standardization (1996). ISO 9613-2: Acoustics – Attenuation of sound during propagation outdoors: Part 2 General Method of Calculation. ISO, London
[28] National Grid (2018). Technical Report TR(T)94. A Method for Assessing the Community Response to Overhead Line Noise. (online) Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN020015/EN020015-000933-5.16.2.6_App%2016.6_TR(T)94%20A%20Method%20for%20Assessing%20the%20Community%20Response%20to%20Overhead%20Line%20Noise.pdf (Accessed 26 August 2021).
[29] National Grid (2021). Policy Statement PS(T)134 - Operational Audible Noise Policy for Overhead Lines Version 2. National Grid, London.

Technical Guidance Document	Context
	separately following the principles of BS4142:2014 (Tier 3). PS(T)134 supersedes TR(T)94 which has been withdrawn as a live National Grid technical report.
National Grid Technical Report TR(E)564 (2021) Development of Method for Assessing the Impact of Noise from Overhead Lines (New Build, Reconductoring, Diversion and Uprating)[30]	Documents the need for a clear policy stance on acceptable noise levels from overhead lines and explains how the noise criteria presented in PS(T)134 were developed, taking into account the UK noise policy context and UK national and international guidance, including World Health Organisation guidelines and evidence for health effects.
National Grid Technical Guidance Note TGN(E)322 (2021) Operational Audible Noise Assessment Process for Overhead Lines (New Build, Reconductoring, Diversion and Uprating)[31]	Provides guidance on the practical implementation of PS(T)134. The policy suite allows for noise impact (and hence significance of effect) to be reported according to the specific requirements of an EIA submitted as part of a DCO application.
Department for Transport (1988) Calculation of Road Traffic Noise (CRTN)[32]	Describes procedures for calculating noise from road traffic.
Highways England (2018) Design Manual for Roads and Bridges: LA111 - Noise and Vibration (DMRB)[33]	Guidance document provides methodology for the assessment of noise from road traffic, particularly from new and altered roads. Also provides modifications to CRTN and a methodology for the assessment of noise and vibration from construction traffic.
TRL (2002) Transport and Road Research Laboratory – Converting the UK traffic noise index $L_{A10,18hr}$ to EU Noise indices for noise mapping (TRL PR/SE/451/02)[34]	A method for converting the road traffic noise indexes described in CRTN to produce outputs in the form of European Union indices, in particular *TRL Method 2* which outlines the conversion of the $L_{A10,18hr}$ noise indices to the $L_{Aeq,16hr}$ and $L_{Aeq,8hr}$ indices.

[30] National Grid (2021). Technical Report(E)5–4 - Development of Method for Assessing the Impact of Noise from Overhead Lines (New Build, Reconductoring, Diversion and Uprating). National Grid, London.
[31] National Grid (2021). Technical Guidance Note TGN(E)322 - Operational Audible Noise Assessment Process for Overhead Lines (New Build, Reconductoring, Diversion and Uprating) Revision 2. National Grid, London.
[32] Department for Transport (DfT) (1988). Calculation of Road Traffic Noise. HMSO, London.
[33] Highways England (2019). Design Manual for Roads and Bridges, LA 111 – Noise and Vibration (Revision 2) (online). (Accessed 30 July 2020).
[34] TRL and Casella Stanger (2002). Method for Converting the UK Road Traffic Noise Index LA10,18h to the EU Noise Indices for Road Noise Mapping. (online) Available at: https://webarchive.nationalarchives.gov.uk/ukgwa/20130402151656/ http:/archive.defra.gov.uk/environment/quality/noise/research/crtn/documents/noise_crtn.pdf (Accessed 25 August 2021).

Technical Guidance Document	Context
World Health Organization (WHO) (1999) Guidelines for Community Noise[35]	Presents guideline noise levels for community noise in specific residential environments, e.g., outdoor living areas.
WHO (2009) Night Noise Guidelines for Europe[36]	Presents guideline noise levels for community noise at night.
WHO (2018) Environmental Noise Guidelines for the European Region[37]	Provides recommendations for protecting human health from exposure to environmental noise from various sources.

14.3 Consultation and engagement

Overview

14.3.1 The assessment has been informed by consultation responses and ongoing stakeholder engagement. An overview of the approach to consultation is provided in **Chapter 4: Approach to Preparing the ES, Volume 5, Document 5.2.4**.

Scoping Opinion

14.3.2 A Scoping Opinion was administered by the Planning Inspectorate on 28 April 2021. A summary of the relevant responses received in the Scoping Opinion in relation to noise and vibration and confirmation of how these have been addressed within the assessment to date is presented in **Table 14.4**.

Table 14.4 – Summary of EIA Scoping Opinion responses for noise and vibration

Consultee	Consideration	How addressed in this chapter
Planning Inspectorate	The ES should include appropriate figures to illustrate the study area adopted for vibration impacts and the receptors within the defined study area.	The extent of the vibration Study Area is described in paragraph 14.7.4, with the receptors identified for assessment listed in **Table 14.28** and **Table 14.29**. The receptors are shown on **Figure 14.1, Volume 5, Document 5.4.14**.
Planning Inspectorate	The Scoping Report does not include any information to describe the vibration characteristics of the existing or proposed substations during operation of the Proposed Development. The Inspectorate also notes that operational vibration associated with vehicles and machinery is identified within Chapter 7	The vibration effects from plant and apparatus within the substations once in operation are expected to be negligible. All existing and all new Super Grid Transformers (SGTs) are/would be mounted on anti-vibration pads.

[35] World Health Organization (1999). Guidelines for community noise. WHO, Geneva.
[36] World Health Organization (2009). Night noise guidelines for Europe. WHO, Copenhagen.
[37] World Health Organization (2018). Environmental Noise Guidelines for the European Region. (online). WHO; Copenhagen.

Consultee	Consideration	How addressed in this chapter
	Biodiversity, as a potentially significant effect to protected and/or notable species that will be taken forward for assessment in the ES. In addition, the Inspectorate notes that there are existing residential receptors located within 100m of the existing substation at Osbaldwick.	An explanation as to why vibration is not expected to cause significant effects is given in **Table 14.13**.
Planning Inspectorate	The Inspectorate does not consider that sufficient information has been provided to conclude that operation of the Proposed Development would not give rise to significant vibration effects during operation. An assessment of likely significant operational vibration effects on protected and/or notable species, and from the works to the existing Osbaldwick Substation on residential receptors within 100m should be presented in the ES, or the ES should set out a justification as to why significant effects are not likely to occur.	An explanation as to why vibration is not expected to cause significant effects during operation of the Project is given in **Table 14.13**. This justifies the approach to scope out of the EIA vibration effects during operation.
Planning Inspectorate	The Scoping Report references the potential for new receptors to contribute to ambient noise levels. The ES should also identify whether there is potential for new sensitive receptors (e.g. new residential receptors) to be introduced into the study area. It is noted that North Yorkshire County Council's consultation response states that there are a number of undetermined planning applications in proximity to the proposed Monk Fryston Substation, which would potentially introduce new residential receptors.	A long list of developments to be considered in the cumulative effects assessment (CEA) has been compiled and refined to a short list (see **Chapter 18: Cumulative effects assessment, Volume 5, Document 5.2.18**). The cumulative assessment is presented in **Section 14.10**. The assessment focuses on the closest receptors to the various proposed elements of the Proposed Development as a worst-case scenario, and therefore receptors at a further distance are not listed in this chapter.
Planning Inspectorate	A list of potential receptors is identified; it is noted that this appears to be primarily comprise of residential receptors and a school, grouped as community receptors, and does not include any receptors located in the Leeds local authority area. The list of potential receptors should be reviewed and updated as further baseline data is gathered and decisions are made,	The list of potential receptors (provided in **Table 14.11**) identifies those receptors closest (within a nominal distance of 1km) to the elements assessed in this chapter. The list has been refined since the issue of the Preliminary Environmental Information Report (PEIR) produced to support Statutory Consultation, to include specific receptors (over

Consultee	Consideration	How addressed in this chapter
	including routeing of construction vehicles and location of the substations and construction compounds, to ensure that all sensitive receptors that may experience significant effects are included within the assessment.	community receptors in the PEIR). As the Project has developed, it has still felt appropriate to not include receptors within the Leeds local authority area as receptors within other local authority areas lie closer to the Project elements assessed in this chapter, as explained in **Section 14.7**. The approach to embedded measures (**Section 14.6**) for receptors within other local authority areas also provides receptors within Leeds City with the mitigation required to avoid significant effects from noise.
Planning Inspectorate	There is no reference to other receptor types that may be sensitive to noise and vibration impacts, such as ecological receptors. The ES must include an assessment of noise and vibration impacts on ecological receptors, where significant effects are likely to occur. Any such assessment should cross refer to findings of other relevant aspect chapters, such as Biodiversity and Historic Environment. The ES should clearly explain any assumptions made regarding the assessment of likely significant effects from noise and vibration on sensitive ecological receptors.	Ecological surveys have been undertaken to support the EIA. The biodiversity assessment (**Chapter 8: Biodiversity, Volume 5, Document 5.2.8**) has considered potential noise effects on ecological receptors (bats, otter, water vole, badger, breeding birds) but the assessment has concluded no significant effects from changes in levels of noise and vibration.
Planning Inspectorate	Effort should be made to agree the monitoring locations with relevant consultation bodies, e.g. Environmental Health departments within the six local authorities. Noise monitoring close to construction compound locations should be representative of the closest sensitive receptors. Noise monitoring should be carried out in accordance with relevant technical standards such as BS 7445 – Description and measurement of environmental noise.	Monitoring locations were agreed with the relevant consultation bodies, as discussed in **Section 14.4**.
Planning Inspectorate	The construction noise assessment must include consideration of noise associated with continuous activities such as cable jointing that may be required during the night-time period.	A construction noise assessment has been undertaken for all periods where construction works are likely to take place and has been assessed following the methodology set out in **Section 14.8**.

Consultee	Consideration	How addressed in this chapter
Planning Inspectorate	No information has been presented regarding the potential for noise emissions to be associated with CSECs. The ES should include a description of the assessment methodologies applied and how significant effects as a result of changes in noise levels have been determined, where relevant.	The assessment methodology for the installation of CSECs is presented in **Section 14.8**, with a construction noise assessment included in **Section 14.9**. The operational noise of CSECs is covered by the overhead line noise assessment as the only potential noise sources from CSECs are the overhead line components. Therefore, the operational noise assessment of CSECs is not referred to again in this chapter, but instead is addressed as part of the overhead line operational assessment.
Planning Inspectorate	The ES should include information regarding planned maintenance arrangements during the operational phase of the Proposed Development, including any noise and vibration impacts arising and maintenance requirements required to mitigate potential noise impacts.	Information regarding planned maintenance is given in **Table 14.13** under the section 'Operational noise from circuit breakers and isolators (switchgear)' and 'Operational noise and vibration from plant at Osbaldwick Substation'. Planned maintenance also includes for Overhead line routine inspections comprising foot patrols and helicopter surveys. It is not anticipated that there will be likely significant effects.
Planning Inspectorate	On the basis that the fixtures and fittings used within the Proposed Development conform to the Technical Specification and Type Registration processes outlined in chapter 14 and therefore would result in no audible noise generation, the Inspectorate agrees that further assessment of this matter as part of the operation of the Proposed Development can be scoped out of the ES.	Whilst this is noted and the assessment of fixtures and fittings for overhead lines has been scoped out of this chapter, please refer back to paragraphs 14.7.22 to 14.7.28 of the Scoping Report to see information on audible noise generation potential from overhead line fixtures and fittings.
North Yorkshire County Council	As is to be expected at this stage the detail is vague in parts, for example embedded environmental measures proposed within the outline CEMP (Section 14.5), categorised receptors by community (Section 14.6, Table 14.4), and uncertainty regarding construction compound location(s). However, overall, the applicant has identified the relevant technical	This chapter has refined the location of construction compounds and likely activities taking place in construction areas based on the latest information available.

Consultee	Consideration	How addressed in this chapter
	guidance and methodologies for assessment.	
North Yorkshire County Council	By way of observation in relation to the new substation at Monk Fryston, I am unable to locate consideration for undetermined applications that are of relevance when considering the likelihood of significant impacts, notably the adjacent gas peaking site (application ref: 2020/0594/FULM) and conversion of stables to residential dwelling (application ref: 2021/0075/FUL). It should be acknowledged that the review of existing noise sources and nearby sensitive receptors is subject to change.	A long list of developments to be considered in the cumulative effects assessment (CEA) has been compiled and refined to a short list (see **Chapter 18: Cumulative effects assessment, Volume 5, Document 5.2.18**). The cumulative assessment is presented in **Section 14.10**. The assessment focuses on the closest receptors (within a nominal distance of 1km) to the various proposed elements of the Project as a worst-case scenario, and therefore receptors at a further distance are not listed in this chapter. It is noted that application ref: 2021/0075/FUL has since been dismissed due to noise concerns, whilst application ref: 2020/0594/FULM has been withdrawn, therefore these applications have not been considered further in this chapter.

Statutory Consultation

14.3.3 Statutory Consultation took place between 28 October and 9 December 2021 in accordance with the Act[4]. Prescribed and non-prescribed consultees and members of the public were included in the consultation. Various methods of consultation and engagement were used in accordance with the Statement of Community Consultation (SoCC) including letters, website, public exhibitions, publicity and advertising in newspapers and webinar briefings.

14.3.4 National Grid prepared a Preliminary Environmental Information Report (PEIR) which was publicised at this consultation stage. National Grid sought feedback on the environmental information presented in that report. Feedback received during statutory consultation was considered by National Grid and incorporated, where relevant, in the design of the Project and Environmental Impact Assessment.

14.3.5 A summary of the relevant responses received to the statutory consultation, together with any subsequent discussions held in relation to noise and vibration and confirmation of how these have been considered within the assessment to date is presented in **Table 14.5.** Statutory consultation representations and National Grid's responses is provided in **Volume 6**, **Document 6.1 (Consultation Report)**.

Table 14.5 – Summary of statutory consultation responses and technical engagement

Consultee	Comments and consideration	How addressed in this chapter
Canal & River Trust	Our review of the PEIR indicates that this risk has not been fully considered (for example, section 14 on noise and vibration primarily considers the nuisance on residential receptors as opposed to the impact of vibrations on land stability.	Vibration at the edge of the River Ouse and riverbank stability will be monitored during piling activities at pylon ID XC421. Remediation plans will be in place should there be any issues. This is described within **Table 14.9** of this Noise and Vibration ES Chapter.
Canal & River Trust	Land stability is a material planning consideration, as highlighted by paragraphs 174 (part e) and 183 of the National Planning Policy Framework (NPPF) and the Planning Practice Guidance (e.g. Paragraph 001 Reference ID: 45-001-20140306). We consider that this advice and guidance clearly identifies that the planning system has a role to play in minimising the risk and effects of land stability on property, infrastructure and the public.	This is acknowledged.
North Yorkshire County Council and Selby District Council	Table 14.16 BS 5228-1:2009 + A1:2014 ABC noise assessment methodology is proposed and the assumption to adopt the lowest Category A noise criteria is proportionate given the predominantly rural construction zones, so too is the 300m buffer for sensitive receptor identification. However, in view of the proposed time period within which noise criteria will apply, I would advise that the potential for significant noise impacts exists from short-lived high impact noise activities such as piling works. Whilst long average target noise criteria and typically appropriate for general construction work, applying this to such high impact activities will likely be to the detriment of residential amenity. This is acknowledged within BS 5228-1:2009 + A1:2014 which states that impulsive noise cannot always be controlled effectively using a long $L_{Aeq,T}$ and instead suggests specifying a short $L_{Aeq,T}$ or looking to control maximum levels (L_{AFmax}). Therefore, I would suggest that a shorter time period is proposed for short-lived high impact noise activities, for	The noise limits for very short and highly impulsive noise are to be controlled through the **CoCP (Volume 5, Document 5.3.3B**). BS 5228-1:2009+A1:2014[23] Section 8.5.2.5 titled 'Methods of monitoring and control on piling sites' recognises that a noise target is appropriate to the type of noise, and is practical and enforceable, adequately protecting the community but allowing work to proceed without placing undue restriction on the activities. It also recognises that impulsive noise cannot always be controlled effectively using a long $L_{Aeq,T}$, and that the specification of a higher short-term $L_{Aeq,T}$ limit is often found useful, however states that where an $L_{A01,T}$ or L_{Amax} limit is defined, that the difference between the $L_{A01,T}$ and $L_{Aeq,T}$ limit depends on the striking rate of the pile driver.

Consultee	Comments and consideration	How addressed in this chapter
	example $L_{Aeq,15min,}$ and that any necessary overnight works do not exceed 60dB L_{AFmax} at sensitive receptors in accordance with World Health Organisation (WHO) criteria for sleep disturbance.	In the absence of demonstrations of compliance, monitoring should be undertaken at the closest noise sensitive receptors (NSRs) whilst piling works are undertaken, as described in the **Noise and Vibration Management Plan** (**Volume 5, Document 5.3.3H**).
North Yorkshire County Council and Selby District Council	VIBRATION: 14.9.20 It is stated that for the ES, separate assessments of temporary vibration effects will be undertaken for different elements of the construction phase, which include piling works. Whilst there is potential for significant vibration effects depending on the techniques used (i.e. percussive vs non-percussive), I would concur that any significant noise impact can be controlled through embedded measures within the outline CEMP, secured by DCO requirement. This should include a piling scheme identifying those plots affected and setting out mitigation measures to protect residents.	It is considered that this comment should refer to significant vibration impact and not significant noise impact. Details on a piling scheme are provided in the **CoCP** (**Volume 5, Document 5.3.3B**).
North Yorkshire County Council and Selby District Council	Operational Phase NOISE: 14.8.24 I am not familiar with document ref 29: 'National Grid (2021). Policy Statement PS(T)134 – Operational Audible Noise Policy for Overhead Lines. National Grid, London.', nor am I able to locate it, but note that residential receptors are screen out of assessment where overhead line noise <34dB(A) on the basis of no adverse impact. Moreover, adverse impact, which is understood to be the trigger for further Tier 3 assessment, is noted to occur where noise levels exceed 37dB(A). Despite justification provided into its use, given that this is National Grid criteria, I would question the overlap with BS4142:2014+A1:2019 here, particularly where night-time background levels of 25dB $L_{A90,T}$ are being assumed and would unlikely trigger Tier 3 assessment while observing a potential exceedance impact of +12dB(A).	Irrespective of background noise assumptions of 25dB at night, the Tier 3 assessment is contingent on conditions during rainfall. During such conditions, residential receptors will be indoors and 37dB rating noise levels originating from overhead lines and incident upon a façade will not result in adverse impacts within the dwelling. Furthermore, the background L_{A90} sound levels will be much higher during rainfall than during the dry conditions which are assumed for the prevailing BS 4142:2014+A1:2019[26] representative background. National Grid document TR(E)564[30] explains the reasoning for the criteria set. It discusses the advantages and disadvantages of setting criteria relating to absolute noise levels and relative to existing background noise levels. It is

Consultee	Comments and consideration	How addressed in this chapter
		concluded that applying criteria on absolute noise levels is considered most appropriate. It then goes on to explain that the WHO Guidelines for community noise[35] suggest an external night-time L_{Aeq} of 45dB being the onset for health effects and therefore the LOAEL for residential properties. BS 8233:2014[38] and ProPG[39] suggest an internal night-time L_{Aeq} of 30dB being the LOAEL for residential properties, which, assuming an open window gives 15dB attenuation, would equate to an external L_{Aeq} of 45dB. The Night Noise Guidelines for Europe[36], however, suggest an external night-time L_{Aeq} of 40dB as LOAEL. Given the wealth of evidence on which the Night Noise Guidelines for Europe[36] are based, 40dB was taken as LOAEL when setting criteria. It is recognised that overhead line noise can be more noticeable and therefore more annoying than the traffic noise data on which the Night Noise Guidelines for Europe 40dB L_{Aeq} figure was based. Therefore, ratings from BS 4142:2014+A1:2019[26] have been applied, with a 6dB tonal penalty for wet noise (giving an acceptable noise limit of less than 34dB) as a worst case, and a 3dB character correction penalty applied for dry noise (giving an acceptable noise limit of less than 37dB), as a dry noise crackle is neither tonal nor intermittent, but otherwise readily distinctive against the residual acoustic environment.

[38]British Standards Institute (2014). BS 8233:2014 Sound Insulation and Noise Reduction. BSI, London.
[39] IoA, ANC, & CIEH, ProPG Planning & Noise: New Residential Development (2017). IoA, ANC, CIEH, London.

Consultee	Comments and consideration	How addressed in this chapter
North Yorkshire County Council and Selby District Council	14.10.12 Developments close to existing Monk Fryston Substation should include refused residential dwelling ref:2021/0075/FUL, current at appeal (appeal ref: APP/N2739/W/21/3282161).	This appeal has since been dismissed and therefore the receptor has not been considered within this assessment.

Technical engagement

14.3.6 Engagement has been undertaken with the local authorities, as described in **Table 14.6**.

Table 14.6 – Summary of technical engagement

Consultee	Engagement	Response
City of York Council Environmental Health	York Environmental Health Officer (EHO) requested clarification regarding the scope of works within City of York	Clarification provided by email and addressed in **Section 14.7**.
Leeds City Council Environmental Health	Leeds CC EHO query on the absence of monitoring location within Leeds	Clarification provided by email and addressed in **Section 14.4**.
Selby District Council Environmental Health	Comments upon the fine details upon proposed monitoring locations within Selby, and comment that the National Grid technical methodology not seen so unable to provide comment	Clarification provided by email and addressed in **Section 14.4**.
Selby District Council Environmental Health	Telephone conversation to discuss the proposed approach to Travellers' encampment adjacent to A63	Approach detailed in **Section 14.8** and **14.9**.

14.4 Data gathering methodology

Study Area

14.4.1 This section sets out the methodology and approach to selecting the Study Area for baseline data gathering and survey work. The geographical Study Area for the assessment is defined in **Section 14.7**.

14.4.2 The approach to defining the Order limits is set out in **Chapter 2: Project Need and Alternatives, Volume 5, Document 5.2.2**. This has been used to inform the spatial scope of the noise and vibration assessment.

14.4.3 For the purposes of identifying potential survey locations for the noise assessment, an overarching Study Area defined in **Section 14.7** (Order limits plus a 1km buffer) has been used as a starting point. This has then been refined for the construction and the operational stages and specific elements of the Project, considering the particular noise source anticipated to impact the local area, as described in this section.

14.4.4 This overarching Study Area (Order limits plus a 1km buffer) is large and comprises predominantly agricultural land. Ambient and background noise levels within the Study Area are considered to be low at all sensitive receptors except those that front an -A road or are in close proximity to the A1(M) motorway, the East Coast Main Line (ECML) railway or near to industrial sites.

Construction noise

14.4.5 The need for, and extent of, baseline data gathering for construction is dependent on the assessment methodology (i.e. whether measured baseline data is used), source (what is to be constructed, and how), the proximity of sensitive receptors and their likely existing noise environment. The following paragraphs set out information on these factors and explain how they influence the data gathering area.

14.4.6 Sources considered for construction noise assessment are the construction works for the new substations, CSECs and 275kV/400kV overhead lines and realigned and reconductored 275kV overhead lines, along with the associated construction compounds. The locations actually selected for noise measurement are dependent on the part of the Project being constructed as set out in the following paragraphs.

14.4.7 Construction noise baseline measurements have been carried out at the locations of new substations, new CSECs and temporary construction compounds. Monitoring has been carried out at the nearest (as required by the operational noise assessment, i.e. within a nominal distance of 1km from the works) representative NSRs surrounding these proposed Project elements as these will be most exposed to any noise from the Project.

14.4.8 No baseline noise monitoring has been conducted along the route of new, realigned and reconductored 275kV/400kV overhead line. For the assessment of construction noise along the overhead lines, the lowest ‘Category A’ (BS 5228-1:2009 + A1:2014[23]) acoustic environment has been assumed, which will provide a worst-case assessment. Where baseline measurements have been carried out for the assessment of operational noise, data has been used for the construction noise assessment, where considered suitable.

14.4.9 The works proposed at the existing Osbaldwick Substation include a new circuit breaker and isolator along with installation of associated underground cabling, and the removal and dismantling of an existing gantry to free up space for new equipment. A new gantry, similar in size but placed at a slightly different location, would then be installed on the existing National Grid operational land and within the substation footprint. Therefore baseline noise monitoring for construction has not been undertaken and instead the lowest ‘Category A’ acoustic environment has been assumed, providing a worst-case assessment.

Operational noise

14.4.10 The need for, and extent of, baseline data gathering for operation is dependent on the assessment methodology (i.e. whether measured baseline data is used), the source (what is to be operational, and how) and the proximity of NSRs. The following

paragraphs set out information on these factors and explain how they influence the data gathering area.

14.4.11 Locations of sources considered for operational noise are the new substations and new and realigned 275kV/400kV overhead lines. The locations selected for noise measurement are dependent on what operational noise sources would be present as set out in the following paragraphs.

14.4.12 For discreet locations (i.e. substations), baseline data to inform the operational noise assessment has been gathered at the nearest (nominally within 1km of the proposed works, but further afield if no such receptors are located within the nominal distance) NSRs surrounding these proposed Project elements.

14.4.13 At the proposed Monk Fryston Substation, where there is an existing substation that will form part of the total noise climate with the Project once in place, measurements have been taken close to the existing infrastructure to characterise the sound, as well as the nearest NSRs surrounding the proposed substation site.

14.4.14 At the proposed Overton Substation, baseline monitoring has been undertaken at the nearest NSRs surrounding the proposed substation site.

14.4.15 Operational noise from Osbaldwick Substation has been scoped out from further assessment as only minor changes are to be made. The proposed changes at Osbaldwick Substation would not result in an increase in noise emissions from the substation and therefore the closest NSRs would not experience change during everyday operation of the substation. Noise from the additional equipment (circuit breaker and isolator) would occur as a result of a planned or unplanned event and is expected to be a short duration click and low level whirring for a duration of a few seconds. It is anticipated that the number of activation events (both planned and unplanned) would be less than 100 a year. Therefore, no baseline data has been gathered for Osbaldwick Substation.

14.4.16 For new 275kV/400kV overhead lines, baseline data has been gathered at a location representative of the nearest NSRs for each of the three new sections of overhead line, to inform the operational noise assessment.

14.4.17 Operational noise for reconductored lines has been scoped out from further assessment as it is anticipated that the 275kV XC overhead line once reconductored would not result in a significant change in electrical stress (the conductor surface voltage gradient, which is determined by the operating voltage and geometrical configuration of the conductor system and pylon) and therefore changes in audible noise levels from this existing overhead line would be negligible. Therefore, no baseline data has been gathered for reconductored lines.

14.4.18 Where realignment takes the overhead line further away from NSRs, the resulting noise levels are predicted to be lower than currently experienced. In addition, there are no existing receptors within 200m of the proposed realigned sections of overhead line and as a consequence operational noise from the realigned line has been scoped out from further assessment. On this basis no baseline data has been gathered for realigned sections of overhead line.

Vibration

14.4.19 The construction vibration Study Area has been defined as a 100m area from any likely significant construction vibration source, such as compaction or piling works. However, for gathering baseline data, no vibration monitoring has been undertaken, as baseline

vibration will be negligible compared to construction levels and will be assessed as an absolute (not relative) value.

14.4.20 Reference may be made to potential receptors outside of the noise Study Area – such as receptors located along potential construction traffic routes or receptors of special interest (such as designated tranquil areas or precision engineering premises). Where this is the case, those potential receptors have been considered as part of the noise and vibration assessment.

14.4.21 For this chapter, this Study Area has been used to identify key noise and vibration sensitive receptors for noise and vibration predictions and assessment on the basis of proximity and sensitivity.

14.4.22 For the operation of the project, vibration has been scoped out of further assessment. Further explanation is provided in **Table 14.13**.

Desk study

14.4.23 A summary of the organisations that have supplied data, together with the nature of that data is outlined in **Table 14.7**.

Table 14.7 – Data sources used to inform the noise and vibration assessment

Organisation	Data Source	Data Provided
British Standard Institute	BS 5228-1:2009 + A1:2014[23]	Noise data for construction noise prediction.
British Standard Institute	BS 5228-2:2009 + A1:2014[24]	Vibration data for construction vibration prediction.
Google	Google® Earth Pro Version 7.3.2.5776[40]	Satellite imagery for establishing location of existing NSRs and current baseline conditions.
National Grid	National Grid network route map[41] data	Approximate locations for the national electricity transmission network.
Defra	Defra Magic Map[42]	Local footpaths, listed buildings, habitats and species which can be used when identifying receptors.
Extrium	Extrium England Noise and Air Quality Viewer[43]	Defra Round 3 Road noise mapping and railway mapping data.
Narda Safety Test Solutions	EFC400 modelling data	Modelling data for overhead line audible noise.

[40] Google (2021). Google Earth Pro version 7.3.4.8248. (online). (Accessed 26 August 2021).
[41] National Grid (2021). Network route maps. (online). Available at: [redacted] (Accessed 26 August 2021).
[42] DEFRA (2021). Magic Map Application. (online). Available at: https://magic.defra.gov.uk/MagicMap.aspx (Accessed 26 August 2021).
[43] Extrium (2021). England Noise and Air Quality Viewer. (online). (Accessed 26 August 2021).

Organisation	Data Source	Data Provided
National Grid	TS 2.03 Technical Specification – Power Transformers and Reactors[44]	Defines the guaranteed maximum sound power level for SGTs.

Survey work

14.4.24 Baseline sound surveys were undertaken between 14 March 2022 and 11 April 2022, exclusive of school holiday periods, with the purpose being to:

- obtain and understand the background and ambient baseline sound environment at locations where operational noise may be observed to provide context to the assessment of operational noise in accordance with BS 4142:2014 + A1:2019[26];
- obtain background and ambient baseline sound measurements at the site of, and at representative sensitive receptors close to the two proposed substations, whilst taking account of noise from the existing Monk Fryston Substation;
- obtain background and ambient baseline sound measurements at representative NSRs near to the route of the proposed 400kV and 275kV overhead lines;
- obtain background and ambient sound measurements at the site of, and at representative sensitive receptors close to CSECs and associated infrastructure (Shipton North/South 400kV CSECs and Tadcaster Tee West/East 275kV CSECs); and
- obtain background and ambient sound measurements near to the proposed construction compounds.

14.4.25 Baseline sound monitoring was undertaken at 13 locations (shown in **Figure 14.1 Volume 5, Document 5.4.14**) as long-term unattended surveys with attended observations.

14.4.26 All ambient and background sound measurements were undertaken under the direct supervision of suitably qualified personnel.

14.4.27 Noise monitoring equipment was set to measure for intervals of 15 minutes in accordance with BS 4142:2014 + A1:2019[26], which states:

> *'8.1.3 Ensure that the measurement time interval is sufficient to obtain a representative value of the background sound level for the period of interest. This should comprise continuous measurements of normally not less than 15 min intervals, which can be continuous or disaggregated'.*

14.4.28 A meteorological station was set up in conjunction with the noise monitoring equipment, also set to 15-minute intervals, so the data was concurrent and available for data analysis. It monitored local wind speeds and direction, precipitation, and air temperature during the ambient and background sound monitoring surveys. The results of the meteorological surveys have been used in the analysis of the ambient and background sound data to ensure that only data collected under appropriate weather conditions was used in defining the baseline sound levels. This approach is advocated within BS 4142:2014 + A1:2019[26] and BS 5228-1:2009 + A1:2014[23].

[44] National Grid (2021). TS2.03 Technical Specification – Power Transformers and Reactors. National Grid, London.

14.4.29 Ambient and background sound measurements were undertaken in accordance with BS 4142:2014 + A1:2019[26] and BS 7445-1:2003[45], i.e. with microphones mounted to a height of 1.2 to 1.5m above ground level and no less than 3.5m from any reflecting surface other than the ground.

14.4.30 Sound levels were measured using integrating averaging sound level meters (SLMs) conforming to Class 1 as defined by BS EN 61672-1:2013[46]. The SLMs were field calibrated before and at the end of each survey period by applying an acoustic calibrator, conforming to BS EN 60942:2003[47], to the microphone to check the sensitivity of the measuring equipment. Any drift in calibration levels were noted upon collection, with no excessive (i.e., greater than 0.5dB) drift observed.

14.4.31 BS 5228-1:2009 + A1:2014[23] describes the 'ABC method' for assessing construction noise, explained in **Section 14.8**, demonstrating how assuming low background and ambient noise levels can form the basis for a worst-case assessment. Therefore, by using this assumption of low background and ambient levels where baseline data has not been gathered, all receptors will be protected by an assessment that considers the worst-case.

14.4.32 Surveys have been scoped out for the following aspects:

- vibration monitoring, as baseline vibration will be negligible compared to construction levels and has been assessed as an absolute (not relative) value;
- noise monitoring within the vicinity of the existing 275kV XC overhead line, as operational noise effects from the reconductoring of this overhead line have been scoped out;
- monitoring of existing road traffic noise as this has been determined through calculation using traffic flow data; and
- noise monitoring within the vicinity of the existing Osbaldwick Substation as there are minimal changes proposed to the operation of the substation and the construction noise assessment has been based on a worst case low ambient noise level.

14.4.33 Where comprehensive measurement data has not been obtained, the following assumptions have been made about baseline sound levels of the area:

- for the assessment of operational noise from the proposed overhead lines, a very low daytime background noise level of 30dB has been assumed and a very low night-time background noise level of 25dB has been assumed. Where the underlying background is lower than this, it would not alter the outcomes of the assessment;
- for assessment of construction noise along the existing overhead lines, the lowest 'Category A' (BS 5228-1:2009 + A1:2014[23], specifically Annex E) acoustic environment, has been assumed; and

[45] British Standards Institute (2003). BS 7445-1:2003 Description and measurement of environmental noise. Part 1: Basic quantities and procedures. BSI, London.
[46] British Standards Institute (2013). BS EN 61672-1:2013 Electroacoustics. Sound level meters. Specifications. BSI, London.
[47] British Standards Institute (2003). BS EN 60942:2003 Electroacoustics. Sound calibrators. BSI, London.

- road traffic noise levels have been determined using CRTN[32] and modelling or calculation of basic noise level (BNL).

14.4.34 In the interest of collecting baseline data for the assessment of construction and operation of substations, construction of CSECs, construction works associated with the construction compounds and the operation of new overhead lines, the locations in which monitoring was undertaken are set out in **Figure 14.1, Volume 5, Document 5.4.14** and **Table 14.8**. Monitoring was undertaken after seeking agreement from the local authorities and landowners.

Table 14.8 – Monitoring locations

Reference	Description of Location	Reason for Monitoring	Receptors represented by monitoring location (see Section 14.7 Potential Receptors)
SH4	Newlands Farm	To gather background and ambient noise levels for the operational assessment of the new overhead line, also can also be used for construction assessment of the temporary construction compounds.	HAM04 HAM05 YOR04
SH3	Hall Moor Farm	To gather background and ambient noise levels for the operational assessment of the new overhead line.	YOR05
SH2	Field located behind properties on South Garth	To gather background and ambient noise levels for the operational assessment of the proposed Overton Substation.	HAM07
SH1	Mill House	To gather background and ambient noise levels for the construction assessment of the temporary construction compounds and the operational assessment of the proposed Overton Substation.	HAM08 HAM09
SK2	Green View Cottage	To gather background and ambient noise levels for the operational assessment of the proposed Overton Substation.	YOR06
SK1	Mercure York Fairfield Manor (located approximately the same distance from A19 and	To gather background and ambient noise levels for the operational assessment of the new overhead line.	YOR07

Reference	Description of Location	Reason for Monitoring	Receptors represented by monitoring location (see Section 14.7 Potential Receptors)
	existing overhead line as YOR07)		
OV1	Overton Grange	To gather background and ambient noise levels for the operational assessment of the proposed Overton Substation and new overhead line.	HAM10 HAM11
HE1	Thickpenny Farm	To gather background and ambient noise levels for the operational assessment of the new overhead line.	HAR02 HAR03 YOR09
TD1	Field located to the east of Red Brick Farm	To gather background and ambient noise levels for the construction assessment of the CSECs and temporary construction compounds.	SEL08 SEL09 SEL10
MF4	Field south of Red Hill Lane, to the west of The Orangery at Lumby Hall	To gather background and ambient noise levels for the operational assessment of the proposed Monk Fryston Substation.	SEL15
MF3	Pollums House Farm	To gather background and ambient noise levels for the operational assessment of the proposed Monk Fryston Substation.	SEL19
MF2	Field located southwest of the A63/A162 roundabout	To gather background and ambient noise levels for the operational assessment of the proposed Monk Fryston Substation.	SEL18 SEL23
MF1	Field to the east of the existing Monk Fryston Substation (southwest of Monk Fryston Lodge)	To gather background and ambient noise levels for the construction and operational assessments of the proposed Monk Fryston Substation.	SEL20 SEL21 SEL22

14.4.35 Long-term measurements were unattended and consisted of at least 5 days of continuous monitoring, including a weekend.

14.4.36 A separate Baseline Noise Monitoring Report is presented within **Appendix 14A**, **Volume 5, Document 5.3.14A**.

14.5 Overall baseline

Current baseline

14.5.1 There may be areas where the assessment is based on an assumed baseline level, for reasons explained in paragraph 14.4.33.

Overview

14.5.2 Land use in the noise Study Area (up to 1km from the Order Limits), is predominantly rural. The baseline ambient noise levels are generally of a low magnitude except where close to major roads, the ECML railway or near to industrial sites. Given the geographical extent of the noise Study Area, the description of the current baseline ambient noise conditions is given going from north to south.

14.5.3 Baseline vibration levels are expected to be low at all receptor locations within the vibration Study Area (up to 100m from the Order Limits).

14.5.4 More information on the current baseline is provided within the Baseline Noise Monitoring Report presented within **Appendix 14A, Volume 5, Document 5.3.1**.

Future baseline

14.5.5 It is expected that road traffic noise will steadily increase due to the natural growth in road traffic flows over time. As outlined in **Section 12.4, Chapter 12, Volume 5, Document 5.2.12**, with regards to the traffic modelling, the future baseline will consider traffic growth as a result of new development based on growth factors from Department for Transport models. Engagement with local planning authorities has also identified potential development that meet the cumulative impact threshold which could also contribute to increases in future baseline ambient noise levels.

14.6 Embedded measures

14.6.1 As part of the design process, embedded environmental measures have been adopted to reduce the potential for adverse noise and vibration effects. These embedded environmental measures have evolved over the development process as the EIA has progressed and in response to consultation. They have been fed iteratively into the assessment process.

14.6.2 Embedded environmental measures include all measures which would be implemented during construction and operation and are generally regarded as industry standard or best practice. This includes production of **CoCP** (**Volume 5, Document 5.3.3B**) that details the best practice construction management methods to be adopted during the construction phase, in addition to the environmental management measures detailed in **Table 14.9**. The full range of noise measures are detailed in the **Noise and Vibration Management Plan** (**Volume 5, Document 5.3.3H**).

14.6.3 A range of environmental measures have been embedded into the Project as outlined in **Chapter 3, Volume 5, Document 5.2.3**. **Table 14.9** outlines the embedded measures specific to the noise and vibration assessment.

Table 14.9 – Summary of the embedded environmental measures

Receptor	Potential Changes and Effects	Embedded Measures	Compliance Mechanism
Construction			
All NSRs	Potential adverse effects from construction noise from mobile and static plant along the construction route	Plant to consist of modern machinery fitted with efficient silencers designed to minimise noise levels.	CoCP secured by DCO requirement 5.
All NSRs	Potential adverse effects from construction noise from static compressors and generators along the construction route	All compressors and generators to be 'sound reduced' models fitted with properly lined and sealed acoustic covers which are to be kept closed whenever the machines are in use.	CoCP secured by DCO requirement 5.
All NSRs	Potential adverse effects from construction noise from static compressors and generators along the construction route	Pneumatic percussive tools to be fitted with mufflers or suppressors.	CoCP secured by DCO requirement 5.
All NSRs	Potential adverse effects from construction noise from mobile and static plant along the construction route	The plant would be properly maintained in accordance with the manufacturers' instructions to ensure that the occurrence of malfunctions, which can give rise to elevated noise levels, is reduced and any malfunctions that do occur are swiftly repaired.	CoCP secured by DCO requirement 5.
All NSRs	Potential adverse effects from construction noise from mobile and static plant along the construction route	Machines in intermittent use shall be shut down in the intervening periods between work or, where this is impracticable, throttled down to a minimum.	CoCP secured by DCO requirement 5.
All NSRs	Potential adverse effects from construction noise from mobile and static plant along the construction route	Where practicable, plant with directional noise characteristics to be positioned to minimise noise at nearby properties.	CoCP secured by DCO requirement 5.

Receptor	Potential Changes and Effects	Embedded Measures	Compliance Mechanism
All NSRs	Potential adverse effects from construction noise from static plant along the construction route	Static equipment and machinery to be sited as far as is practicable from inhabited buildings.	CoCP secured by DCO requirement 5.
All NSRs	Potential adverse effects from construction noise	Acoustic screening will be installed around construction working areas where required as identified as required by **Appendix 14D** (**Volume 5, Document 5.3.14D**).	NVMP secured by DCO requirement 5.
Riverbanks of the River Ouse	Potential adverse effects from piling construction works.	Riverbank stability and vibration at the edge of the River Ouse will be monitored should impact piling be undertaken at pylon ID XC421.	CoCP secured by DCO requirement 5.
Operation			
Monk Fryston NSRs	Potential adverse effects from the operation of a new substation	Locating the proposed Monk Fryston Substation adjacent to the existing substation to minimise the potential for new receptors being exposed to operational noise from the four SGTs.	DCO works plans, Order Limits DCO Article 5.
NSRs close to proposed Monk Fryston Substation	Potential adverse effects from the operation of the new Monk Fryston Substation	Sourcing SGTs and inclusion of noise enclosures to achieve an insertion loss of 20 dB at 100Hz within the proposed Monk Fryston Substation to National Grid technical specifications which include requirements regarding audible noise including confirmation by type testing and Factory Acceptance testing.	NVMP, DCO requirement 5.
NSRs close to proposed Overton Substation	Potential adverse effects from the operation of Overton Substation	Sourcing SGTs and inclusion of noise enclosures to achieve an insertion loss of 20 dB at 100Hz within the proposed Overton Substation to National Grid technical specifications which include requirements regarding audible noise including confirmation by type testing and Factory Acceptance testing.	NVMP, DCO requirement 5.
All NSRs	Potential adverse effects from the	Locating the proposed substations, associated infrastructure, CSECs	DCO works plans, Order

Receptor	Potential Changes and Effects	Embedded Measures	Compliance Mechanism
	operation of the Project	and new and realigned sections of overhead line away from noise sensitive receptors where possible. The configuration of the conductor system to minimise electrical stress, and hence audible noise, as far as practicable.	Limits and LoDs, DCO requirement 3.
Vibration sensitive receptors close to proposed substations	Potential adverse effects from the operation of new substations	SGTs and, if required, standby generators, within the substation would be mounted on anti-vibration mountings, meaning the vibration from plant and apparatus within the substation would be very low level.	NVMP, DCO requirement 5.

14.7 Scope of the assessment

The Project

14.7.1 All elements of the Project are considered as part of the assessment except for the operation associated with the reconductored 275kV XC overhead line, overhead line fixtures and fittings and the operation of Osbaldwick Substation. Justification for the scoping out of these elements is provided in **Table 14.13**.

Spatial scope

14.7.2 The approach to defining the Order limits is set out in **Chapter 3: Description of the Project, Volume 5, Document 5.2.3**. This has been used to inform the spatial scope of the noise and vibration assessment. The study area has been refined through the process of gathering baseline environmental information. The 1km buffer described in the Scoping Report has therefore been refined within this chapter.

14.7.3 For the purposes of identifying potential receptors for the noise assessment, the noise Study Area was redefined depending on the Project element and whether it was for construction noise or operational noise assessment, as follows:

- construction noise, including construction compounds: based upon BS 5228-1:2009 + A1:2014[23] and experience of several linear infrastructure projects, a study area of up to 300m from any construction activity or extent of identification of significant effects if this is beyond 300m has been applied. This approach has been used successfully on recent major infrastructure projects, such as High Speed 2 (HS2);
- construction traffic noise: where an increase or decrease in road traffic volumes or traffic types caused by the construction of the Project would be likely to cause a change in noise level exceeding 1dB $L_{Aeq,T}$ during either the daytime (07:00 – 23:00) or night-time (23:00 – 07:00), as advocated in DMRB[33];
- operational noise from new or significantly realigned overhead lines: up to 200m from the Limit of Deviation or extent of identification of significant effects if this is beyond 200m; and

- operational noise from new substations: up to 1km from the Order Limits surrounding the proposed substations.

14.7.4 For the purposes of identifying potential receptors for the construction vibration assessment, based upon BS 5228-2:2009 + A1:2014[23] and experience of several construction vibration assessments and schemes of monitoring, a vibration Study Area has been defined as a 100m area from any likely significant vibration source, such as compaction or piling works.

14.7.5 Reference may be made to potential receptors outside of the Study Areas defined above, such as receptors of special interest (such as designated tranquil areas or precision engineering premises). Where this is the case, those potential receptors have also been considered as part of the noise and vibration assessment.

Temporal scope

14.7.6 The temporal scope of the assessment of noise and vibration is consistent with the period over which the Project would be carried out and therefore covers the construction period, currently proposed to take place between 2024 and 2028, with some elements of the Project becoming operational in 2027, and the operational period thereafter.

14.7.7 Site based construction noise and vibration for the Project has been assessed at a point when the maximum plant is in use on site. Where there are different phases to the works, the maximum plant for each phase has been taken into consideration in the assessment. Noise from road traffic associated with construction has been assessed during the year of construction that is expected to see the peak traffic flow week.

14.7.8 Whilst the assessments have focused on points in time, consideration has been given to the duration of the effect as relevant to the different phases and activities within those phases (e.g. some construction effects last for only days whilst some may last for weeks).

14.7.9 The Project is expected to have a life span of more than 80 years. If decommissioning is required at this point in time, then activities and effects associated with the decommissioning phase are expected to be of a similar level to those during the construction phase works, albeit with a lesser duration. Therefore, the likely significance of effects relating to the construction phase assessment will be applicable to the decommissioning phase and decommissioning effects are not discussed further in this chapter.

Potential receptors

14.7.10 The spatial and temporal scope of the assessment enables the identification of receptors which may experience a change as a result of the construction and/or operation of the Project.

14.7.11 The principal noise and vibration receptors that have been identified as being potentially subject to effects are summarised in **Table 14.10**.

Table 14.10 – Noise and vibration receptors subject to potential effects

Receptor	Reason for Consideration
Residential – residences, including private gardens where appropriate	These dwellings, occurring within the Study Area of the Project, have the potential to experience a change as a result of the Project and potentially adverse effects.
Travellers' encampment at Monk Fryston	This encampment, albeit not benefitting from planning consent for lawful occupation, contains vulnerable receptors that may be particularly adversely affected by noise and vibration and are therefore considered within this assessment.
Community services – e.g. schools (during daytime periods), places of worship	These sites, occurring within the Study Area of the Project, have the potential to experience adverse effects as a result of the Project.
Commercial – e.g. offices, retail, entertainment venues and eateries, leisure facilities	These sites, occurring within the Study Area of the Project, have the potential to experience adverse effects as a result of the Project.
Leisure areas – e.g. local nature reserves	These sites, occurring within the Study Area of the Project, have the potential to experience adverse effects as a result of the Project.
Terrestrial ecology – e.g. designated sites include Special Protection Areas and Sites of Special Scientific Interest	These sites and species have the potential to experience adverse effects as a result of the Project and are reported in **Chapter 8: Biodiversity, Volume 5, Document 5.2.8**.
Historic environment – e.g. scheduled monuments, listed buildings	These sites and buildings have the potential to experience adverse effects as a result of the Project and are reported in **Chapter 7: Historic Environment, Volume 5, Document 5.2.7**.

14.7.12 Based on the information set out in **Section 14.8**, potential receptors have been selected based on their location relative to the Project components. Generally, the potential receptors are residential dwellings which are considered to have a 'medium' sensitivity to noise and vibration. The locations of the identified receptors and their location relative to the Order Limits are shown in **Figure 14.1, Volume 5, Document 5.4.14** and these are summarised by local authority administrative area in **Table 14.11**.

14.7.13 SEL16 and SEL17 are both located on a Travellers' encampment near Monk Fryston and receptors are housed within caravans. Travellers are considered a vulnerable sub-group and as such are considered to have a 'high' sensitivity to noise and vibration.

Table 14.11 – Potential NSRs identified

Local Authority	ID	Community/receptor	British National Grid Reference	
			X	Y
Selby	SEL01	Smaws Court north	447117	443642
	SEL02	Smaws Court south	447149	443523
	SEL03	The Lodge, A659	447250	443135
	SEL04	Tadcaster Grammar School	445645	442487
	SEL05	High Moor Farm	446262	442317
	SEL06	High Moor Grange Farm	445406	442182
	SEL07	Sutton Grange, Garnet Lane	446892	442051
	SEL08	Lawnwith House, Garnet Lane	446597	441844
	SEL09	Red Brick Farm House west, Moor Lane	446416	441766
	SEL10	Red Brick Farm House east, Moor Lane	446512	441741
	SEL11	Sutton with Hazlewood, north of Chantry Lane	445844	440337
	SEL12	Newstead Farm	446118	438171
	SEL13	Lower Cold Hill Farm	446786	435275
	SEL14	14 Hall Lane, Newthorpe	446958	432273
	SEL15	The Cottage, Butts Lane, Lumby	448607	430132
	SEL16	Traveller encampment, A63/A1(M) roundabout west	447561	429768
	SEL17	Traveller encampment, A63/A1(M) roundabout east	447620	429776
	SEL18	Stonehurst	449235	429680
	SEL19	Pollums House Farm	447916	429485
	SEL20	The Bungalow, Monk Fryston Lodge	448922	429407
	SEL21	Monk Fryston Lodge east	449004	429424
	SEL22	Monk Fryston Lodge west	448908	429338
	SEL23	2 Betteras Hill Road	449401	429188
Harrogate	HAR01	Barley Mow, East Lane	451283	456768
	HAR02	Park Farm	452617	456660
	HAR03	Thickpenny Farm	453244	456048

Local Authority	ID	Community/receptor	British National Grid Reference	
			X	Y
	HAR04	Roman Road	451061	454902
	HAR05	Station House, Marston Lane	451046	454606
	HAR06	Jesmond Cottage, Tockwith Road	449347	451882
	HAR07	North End Farm	449510	451795
	HAR08	The Innams	448729	450320
Hambleton	HAM01	Laund House south	455892	460725
	HAM02	Laund House north	455669	460549
	HAM03	Hall Farm	455507	460395
	HAM04	Agricola, Newlands Farm	456830	460250
	HAM05	Newlands Farm	456830	460143
	HAM06	Plainville Lake	457682	459798
	HAM07	South Garth, Shipton by Benningbrough	455394	458312
	HAM08	Mill House, York Road	455307	458112
	HAM09	The Sidings	455144	457961
	HAM10	Overton Grange	455119	456590
	HAM11	1 Overton Road	455268	455954
York	YOR01	Plainville Farm	457955	459977
	YOR02	Plainville Hall	458051	459945
	YOR03	North Hall Moor	457014	459595
	YOR04	Woodstock Lodge	456175	459105
	YOR05	Hall Moor Farm Cottages	456807	458792
	YOR06	Green View Cottage	456420	456764
	YOR07	Grantchester, Stripe Lane	456596	456103
	YOR08	Woodhouse Farm	453794	455835
	YOR09	Carr Close	464091	451978
	YOR10	Meam Close	463959	451585
	YOR11	Redbarn Drive	463992	451533
	YOR12	Grimston Lodge	464589	451590

14.7.14 It should be noted that a potential receptor, located at BGR 455451, 457829, was picked up during a desk study as being a potential receptor, however further investigations, including a site walkover, have ruled this out as a residential dwelling.

Likely significant effects

14.7.15 The effects on noise and vibration receptors which have the potential to be significant and have been taken forward for detailed assessment are summarised in **Table 14.12**.

Noise sources

14.7.16 For the operational stage, substations and overhead lines are potential sources of noise. Substations would contain new reactive plant such as Super Grid Transformers (SGTs), plus associated cooling systems, along with passive plant such as switchgear. Reactive plant can give rise to a characteristic tonal noise, described as a 'hum'. The noise commonly has tonal components that are harmonics of the 100Hz acoustic fundamental frequency which is twice the 50Hz alternating current (AC) frequency at which the UK electricity supply system operates. Where sited close to NSRs, reactive plant is commonly supplied with an enclosure designed to provide noise reduction and is proposed at both the new Monk Fryston and Overton Substations.

Table 14.12 – Noise and vibration receptors scoped in for further assessment

Receptor	Likely significant Effects
Construction	
NSRs: Within 50m from the kerb of any road with a predicted increase in Basic Noise Level (BNL) of at least 1dB(A).	Construction traffic – potential for increased road traffic noise on local roads due to construction traffic accessing and leaving site.
NSRs: • HAM04 - 05 • HAM07 - 10 • SEL04 – 10 • SEL16 - 17 • SEL19 - 22 • HAR03 • YOR03 - 12	Potential for construction activity noise effects due to the construction of the proposed Overton Substation and Monk Fryston Substation, Shipton North/South 400kV CSECs, Tadcaster Tee West/East 275kV CSECs, the minor works being undertaken at Osbaldwick Substation, and new, realigned and replacement overhead line pylons.
NSRs: • HAM04 – 05 • YOR03 • SEL04 - 10	Installing underground cables – potential construction noise and vibration effects due to drilling and potential piling requirements for the installation of underground cabling, Shipton North/South 400kV CSECs and Tadcaster Tee West/East 275kV CSECs.
NSRs and vibration sensitive receptors: • HAM04 – 05 • HAM08 – 10 • HAR01 • HAR03 • YOR05 • YOR06 • SEL05 – 10 • SEL16 - 17	Piling works – potential for construction noise and vibration effects due to site piling activities at the proposed Overton Substation and proposed Monk Fryston Substation, new and replacement overhead pylons and Shipton North/South 400kV CSECs and Tadcaster Tee West/East 275kV CSECs.

Receptor	Likely significant Effects
• YOR03 • SEL19 - 22	
NSRs: • HAR04 - 08 • SEL01 - 03 • SEL08 - 13	Reconductoring and strengthening – potential for construction noise effects due to reconductoring and strengthening works along the existing 275kV XC overhead line.
NSRs and vibration sensitive receptors: • HAM04 – 05 • HAM10 - 11 • HAR01 – 03 • YOR07 – 08 • SEL16 – 17 • SEL19	Dismantling works – potential construction noise and vibration effects due to the dismantling of existing pylons/overhead line.
NSRs and vibration sensitive receptors: • SEL05 – 10 • SEL19 – 22 • YOR03 – 04 • HAM08 – 09 • HAM04 – 05	Construction compounds – potential construction noise and vibration effects due to activities taking place within construction compounds.
Operation	
NSRs: • HAM07 – 10 • YOR06 • SEL15 – 23	Operation of Monk Fryston and Overton Substations – potential for noise effects from new SGTs at the proposed Monk Fryston Substation and proposed Overton Substation.
NSRs: • HAM10 • YOR03 - 07	New overhead lines – potential for noise effects from new overhead lines.

14.7.17 The receptors/effects detailed in **Table 14.13** have been scoped out from being subject to further assessment because the potential effects are not considered likely to be significant.

Table 14.13 – Summary of effects scoped out of the noise and vibration assessment

Receptors/potential effects	Justification
Commercial receptors	As shown in **Table 14.14**, commercial receptors have a negligible sensitivity to noise and vibration and therefore are not considered further.
Construction traffic vibration	Whilst there is guidance on assessing groundborne vibration due to road traffic provided within the superseded

Receptors/potential effects	Justification
	DMRB (HD 213/11)[48], this has now been removed from the updated DMRB (LA111)[33] guidance, which states: *"Operational vibration is scoped out of the assessment methodology as a maintained road surface will be free of irregularities as part of project design and under general maintenance, so operational vibration will not have the potential to lead to significant adverse effects"*. There were a number of issues associated with the assessment of groundborne vibration outlined in the superseded guidance. The issues noted were the level of detail required to accurately predict groundborne vibration, that traffic induced groundborne vibration is caused by irregularities in the road surface (the maintenance of surfaces of public highways is outside of the control of developers), and that, even near heavily trafficked roads, measured groundborne vibration levels are typically equivalent to those caused by internal activities within dwellings such as closing doors, operating domestic appliances and walking on suspended wooden floors. On the basis of the above, and as the revised DMRB (LA111) [33] document contains National Highways' preferred assessment methodology, assessment of groundborne vibration due to road traffic associated with the Project is scoped out of this assessment.
Effects due to operational noise effects from refurbished and reconductored 275kV XC overhead line	The reconductoring of these lines would not result in a significant change in electrical stress and therefore audible noise levels during operation of these lines would also not result in a significant change. Where realignment is expected to take place, the screening assessment has been carried out and reported in **Appendix 5.3.14E, Volume 5, Document 5.3.14E**. It has been determined that realignment will not result in significant effects.
Operational noise effects from new and existing overhead line fixtures and fittings	To be approved for use on the National Grid high voltage electricity transmission network, each fitting design must be Type Registered. Type Registration comprises a series of tests on the fitting in question to ensure compliance with the relevant technical specification. These tests include performance requirements for corona inception, and hence audible noise,

[48] The Highways Agency (2011). Design Manual for Roads and Bridges HD 213/11 Noise and Vibration. (online) Available at: https://www.bradford.gov.uk/Documents/Hard%20Ings%20Road%20improvement%20scheme/3%20Public%20Inquiry%20Documents/Core%20Bundle/004%20-%20DMRB/HD%20213%2011%20Noise%20and%20Vibration//hd21311%20Noise%20and%20Vibration.pdf (Accessed 15 July 2022).

Receptors/potential effects	Justification
	on all fittings along with wind tunnel testing of insulators for audible tones generated by Aeolian mechanisms. Once the fitting has been Type Registered and approved for use, a number of further tests are also carried out post-manufacture in the form of Sample Testing. This ensures the fitting conforms to the specification in the Type Registration document. The Technical Specification and Type Registration processes reduce the potential for audible noise and tones to occur from all types of fittings, including insulators. Where noise does occur, it is likely to be localised and of short duration. If due to a fault, actions can be taken to rectify it. Where noise from fittings does occur, which results in a complaint, appropriate actions can be taken to seek to remedy the cause of the noise, usually through cleaning or replacement of the relevant fitting. Therefore, noise effects from fixtures and fittings are scoped out of further assessment.
Operational vibration effects from substations	On substation sites there would not be any large items of rotating plant that may give rise to significant vibration. Reactive plant (which includes transformers) would be placed on anti-vibration pads to minimise the transfer of vibration to the ground. Residual vibrational effects are not likely to be perceptible or significant beyond a few metres from the source. Measurements on an operating Super Grid Transformer (SGT) at a substation in the UK determined peak particle velocity (PPV) vibration levels of 0.12mm/s at a distance of 6m from the SGT. BS 5228-2:2009 + A1:2014[24] states that a vibration velocity of 0.14mm/s might be just perceptible in the most sensitive situations. Consequently, it is unlikely that vibration from an SGT would be perceptible beyond a few metres. Given the distances of receptors from the proposed Monk Fryston Substation and proposed Overton Substation and the existing Osbaldwick Substation, it is unlikely that plant within the substations would give rise to any perceptible vibration at the nearest sensitive receptor.
Operational noise effects from circuit breakers and isolators (switchgear)	Operational noise effects from new switchgear (circuit breakers and isolators) at all substations has been scoped out. In everyday operation this equipment is passive, in that there is nothing that gives rise to noise. When it does operate it is used for two purposes. One is regarded as emergency operation where it protects the system from faults (unplanned). The second is to de-energise parts of the system for maintenance (planned). The switchgear noise is mechanical in nature and only occurs during a switching event with the noise being

Receptors/potential effects	Justification
	generally described as a ‘click’. It does not produce tonal noise (i.e. a ‘hum’). Typically, the switchgear for the whole site operates less than 100 times per year in total (both planned and unplanned events). That operation lasts for a few seconds on each occasion, although switching events tend to occur in ‘clusters’, with a few events on one day then nothing for months. Therefore, operational noise from circuit breakers can be scoped out from all operational substation assessments.
Operational noise and vibration effects from plant at Osbaldwick Substation	Circuit breakers and isolators similar in operation to those proposed (described above) are already present at Osbaldwick Substation and are understood to operate without complaint from nearby residents. Therefore noise effects from switchgear are scoped out of further assessment as stated above. As described in the section of this table ‘Operational vibration from substations’, substations will not give rise to levels of vibration that could give rise to likely significant effects. Therefore operational vibration effects are also scoped out for Osbaldwick Substation.

14.8 Assessment methodology

14.8.1 The generic project-wide approach to the assessment methodology is set out in **Chapter 4: Approach to Preparing the ES, Volume 5, Document 5.2.4**. However, whilst this has informed the approach that has been used in this noise and vibration assessment, it is necessary to set out how this methodology has been applied, and adapted as appropriate, to address the specific needs of this noise and vibration assessment.

Establishing baseline conditions

14.8.2 As set out in **Section 14.4**, baseline noise surveys have taken place. For receptors where baseline levels have not been gathered, a worst-case scenario has been assumed of very low ambient and background levels for both construction and operational noise assessments for this chapter, as explained in paragraph 14.4.33.

Establishing receptor sensitivity

14.8.3 The EIA Regulations recognise that developments will affect different environmental elements to differing degrees, and that not all of these are of sufficient concern to warrant detailed investigation through the EIA process. The EIA Regulations identify those environmental resources that warrant investigation as those that are *‘likely to be significantly affected by the development’*.

14.8.4 The EIA Regulations do not define significance and it is necessary to state how this is defined for EIA. The significance of an effect resulting from a development during construction or operation is most commonly assessed by reference to the sensitivity (or value) of a receptor and the magnitude of the effect. This approach provides a

mechanism for identifying areas where mitigation measures may be required and to identify the most appropriate measures to alleviate the risk presented by the development.

14.8.5 The precise determination of the sensitivity of a receptor relies on professional judgement.

14.8.6 **Table 14.14** details the basis for assessing receptor sensitivity which has been produced on the basis of experience of assessing similar facilities, and on professional judgement.

Table 14.14 – Establishing the sensitivity of receptors

Sensitivity	Examples
High	Vulnerable subgroups including hospitals and pre-schools, care homes, hospices, recording studios.
Medium	Dwellings, schools, hotels.
Low	Areas used primarily for leisure activities, including PRoW, sites of historic or cultural importance, and significant watercourses i.e. the River Ouse
Negligible	All other areas such as those used primarily for industrial, commercial or agricultural purposes.

14.8.7 The precise determination of impact magnitudes for construction and operational noise effects are based on relevant guidance and professional judgement. For example, DMRB[33] provides criteria which may be directly transposed to different impact magnitude categories for road traffic noise (both construction and operational). However, the assessment methodology for operational site noise in BS 4142:2014+A1:2019[26] does not readily transpose for the Project in this way.

14.8.8 The overall significance of effect rating is based on the evaluation of significance matrix presented in **Table 14.15**.

Table 14.15 – Significance of effect matrix for construction noise and vibration and operational noise from substations

Level of significance to sensitivity of receptor/ resource	Magnitude of change			
	High	**Medium**	**Low**	**Negligible**
High	Major (significant)	Moderate/Major (significant)	Minor/Moderate (potentially significant)	Minor (not significant)
Medium	Moderate/Major (significant)	Minor/Moderate (potentially significant)	Minor (not significant)	Negligible/Minor (not significant)
Low	Minor/Moderate (potentially significant)	Minor (not significant)	Negligible/ Minor (not significant)	Negligible (not significant)
Negligible	Minor (not significant)	Negligible/ Minor (not significant)	Negligible (not significant)	No effect

Construction noise and vibration assessment methodology

14.8.9 The increase in traffic noise due to construction traffic on the local road network has been predicted using methodologies described in CRTN[32] (as advocated by DMRB[33]). The magnitude of impact of noise due to construction traffic on local roads has been assessed with reference to the methodology set out in DMRB[33].

14.8.10 Construction noise (including noise due to slow-moving construction traffic noise on haul roads) has been predicted and assessed using the methodologies described in BS 5228-1:2009 + A1:2014[23]. Table E.1 in Annex E of BS 5228-1:2009 + A1:2014[23] (reproduced in **Table 14.16**) and Table 3.12 of DMRB[33] (reproduced in **Table 14.17**) has been used to determine the threshold of significance. The determination of magnitude of impact for construction noise will be assessed with reference to the methodology set out in BS 5228-1:2009 + A1:2014[23].

14.8.11 Proposed core construction working hours are as follows:

- 07:00 – 19:00 Mondays – Fridays;
- 08:00 – 17:00 Saturdays, Sundays, and bank holidays;
- no piling works on Sundays or bank holidays, and restricted to 09:00 – 14:00 on Saturdays; and
- these core working hours referred to above exclude start up and close down activities of up to one hour either side of the core working hours.

14.8.12 Some activities may require working outside of the core working hours, for example the installation of overhead lines crossing the East Coast Main Line (ECML) railway, major roads and other infrastructure to minimise daytime closures of these transport links. Works which may take place outside of the core working hours listed above are:

- the jointing of underground cables with the exception of cable cutting which will only take place during core working hours;

- the installation and removal of conductors, pilot wires and associated protective netting across highways, railway lines or watercourses;
- the completion of operations commenced during the core working hours which cannot safely be stopped, such as decommissioning of redundant pylons;
- any highway works requested by the relevant highway authority to be undertaken on a Saturday or a Sunday or outside the core working hours;
- oil processing of transformers or reactors in substation sites;
- the testing or commissioning of any electrical plant installed as part of the authorised development;
- the completion of works delayed or held up by severe weather conditions which disrupted or interrupted normal construction activities; and
- security monitoring.

14.8.13 For both construction activity noise and construction traffic noise assessment methodologies, the duration of the proposed works has been considered as a factor in the determination of significant effects.

Table 14.16 – Example threshold of potential significant effect 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

NOTE 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*

NOTE 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 $L_{Aeq,T}$ *noise level for the period increases by more than 3dB due to site noise.*

NOTE 3: Applied to residential receptors only

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

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

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

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

Table 14.17 – Construction time period – LOAEL and SOAEL

Time Period	LOAEL	SOAEL
Day (07:00 – 19:00 weekday and 07:00 – 13:00 Saturdays)	Baseline noise levels $L_{Aeq,T}$	Threshold level as determined by BS 5228-1 Section E3.2 and Table E.1 BS 5228-1[23].
Night (23:00 – 07:00)	Baseline noise levels $L_{Aeq,T}$	Threshold level as determined by BS 5228-1 Section E3.2 and Table E.1 BS 5228-1[23].
Evening and weekends (time periods not covered above)	Baseline noise levels $L_{Aeq,T}$	Threshold level as determined by BS 5228-1 Section E3.2 and Table E.1 BS 5228-1[23].

14.8.14 Construction vibration effects have been assessed for sensitive receptors within 100m of any vibration causing construction activities (such as piling). Sensitive receptors may include precision engineering premises, healthcare premises and old dwellings with poorly constructed foundations. Railways and buried services such as gas and water mains have been assessed, if identified as present and in need of assessment due to their proximity to the proposed construction works and their sensitivity to vibration.

Determination of magnitude – construction noise

14.8.15 **Table 14.18** provides the criteria that will determine the impact magnitudes for construction noise, based on the guidance provided in BS 5228-1:2009 + A1:2014[23].

Table 14.18 – Impact magnitudes of construction noise

Magnitude	Description
High	Levels very much greater than baseline and very disruptive
Medium	Levels greater than baseline and disruptive
Low	Levels equal to or greater than baseline, but not disruptive
Negligible	Levels less than baseline

Determination of magnitude – construction vibration

14.8.16 **Table 14.19** provides the criteria to determine the impact magnitudes for construction vibration, based on the guidance provided in BS 5228-2:2009 + A1:2014[24].

Table 14.19 – Impact magnitudes of construction vibration

Magnitude	Description
High	≥ 10 mms^{-1} PPV Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.
Medium	1 mms^{-1} – 10 mms^{-1} PPV 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.
Low	0.3 mms^{-1} – 1 mms^{-1} PPV Vibration might be just perceptible in residential environments.
Negligible	< 0.3 mms^{-1} Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. Unlikely to be perceptible in residential environments.

Determination of magnitude – construction traffic noise

14.8.17 **Table 14.20** provides the proposed impact magnitude categories for assessing construction traffic noise, determined based on the guidance contained within DMRB[33] and using professional judgement. This is based on BNL calculations of the construction traffic.

14.8.18 This approach is only suitable for roads where the baseline flow is in excess of 4000 movements daily. Where lower flows than this are assessed the numeric change in BNL alone is not an indication of the overall impact from construction traffic.

Table 14.20 – Establishing the magnitude of impact of construction traffic at receptors

Magnitude	Increase in BNL of closest public road used for construction traffic, dB
High	Greater than or equal to 5.0.
Medium	Greater than or equal to 3.0 and less than 5.0.
Low	Greater than or equal to 1.0 and less than 3.0.
Negligible	Less than 1.0.

14.8.19 The determination of significance will be calculated using the information provided in **Table 14.14** to determine the sensitivity of receptors and the information in **Table 14.18** and **Table 14.20** to determine the magnitude of impact. This will then be compared to the significance of effect matrix provided in **Table 14.15** to determine the significance of effect.

Operational noise assessment methodology

CSECs

14.8.20 In relation to the operation of CSECs, and following discussions with stakeholders at Scoping stage, operational noise assessment of CSECs is scoped out of the assessment.

Proposed new 275kV and 400kV overhead lines

14.8.21 Detailed operational noise predictions for the new 275kV and 400kV overhead lines follow the principles of BS 4142:2014 + A1:2019[26] using the noise prediction method described in National Grid Policy Statement PS(T)134[29] and its supporting technical guidance[30,31]. These documents are provided as technical appendices (**Appendix 14F – Appendix 14H, Volume 5, Documents 5.3.14F – 4.3.14H**).

14.8.22 The overhead line noise assessment process follows a three-tier approach based on predicted noise source level and receptor distance. The first two tiers are screening tools based on the principles of BS 4142:2014 + A1:2019[26] utilising modelled outputs.

14.8.23 The assessment methodology is detailed in Sections 1 - 3 of **Appendix 14E** (**Volume 5, Document 5.3.14E**).

Substations

14.8.24 Operational noise from the proposed Overton and Monk Fryston Substations has been assessed using BS 4142:2014 + A1:2019[26].

14.8.25 The noise generating plant at the substation is principally related to the SGTs, specifically the SGT tanks. These generate significantly more noise than any other plant and the sound is predominantly within the 100 Hz third octave. As such, it is customary to assume the unmitigated site will be tonal.

14.8.26 BS 4142:2014 + A1:2019[26] provides a methodology and criteria for assessing new or existing industrial sound sources by comparing the operational sound (rating level) at the location of a sensitive receptor, with the background sound levels that are currently experienced without the development.

14.8.27 The rating level is defined as the specific sound level, with the addition of character corrections to consider certain acoustic features that could potentially increase the significance of impact. A penalty will be applied to the specific sound level if a tonal, impulsive, intermittent or other characteristic is present or is expected to be present for new or modified sound sources.

14.8.28 The assessment methodology outlined in BS 4142:2014 + A1:2019[26] indicates that the greater the difference of the rating level in comparison with the background sound level (L_{A90}) the greater the significance of the impact, thus:

- a difference of +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- a difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
- 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 impact. A low impact is defined when the rating level does not exceed the measured background sound level.

14.8.29 BS 4142:2014 + A1:2019[26] emphasises the requirement to fully understand the context in which the sound occurs and therefore context has been considered in the assessment process before determining the potential significant effect resulting from the impacts identified. For this reason, the semantic scale for magnitude of change, or values for the purposes of identifying LOAEL and SOAEL have been reported in detail in the assessment section of this chapter.

Unexpected or emergency operations

14.8.30 The coolers for SGTs are designed to engage only at times of high load for the transformer. Such conditions usually occur only during exceptional events, for example extreme weather combined with faults elsewhere on the system, requiring an SGT to carry a higher-than-normal load. These conditions would usually occur less than once per annum and persist for a short duration (i.e. no more than one day) and as such cooler operations can typically be regarded as an exceptional event. The coolers are designed to operate in a staged manner such that banks of two fans are brought into operation as needed up to the maximum of four. Each cooler associated with the SGTs must achieve a guaranteed maximum of 93dB(A) sound power level, as described in National Grid Technical Specification TS 2.03[44]. The specification is based on an older generation of fan and is considered a worst-case. Noise from cooling systems is readily controlled using conventional and readily available noise control measures. It is anticipated that noise due to the operation of coolers would be not significant.

14.8.31 There will be a stand-by generator located at the substations. This will operate in emergency conditions. Maintenance and testing of the stand-by generator shall be undertaken predominantly during daytime hours to minimise disruption at nearby receptors. As the stand-by generator will only operate in emergency circumstances and for a short duration at any time, it has not been qualitatively assessed.

Determination of significance – operational substations

14.8.32 **Table 14.21** below provides the indicative impact magnitude categories for assessing operational noise from substations, based on the results of the estimate of impact undertaken in accordance with BS 4142:2014 + A1:2019[26]. The final determination of impact magnitude depends on consideration of the context, as required by the method detailed in BS 4142:2014 + A1:2019[26].

Table 14.21 – Indicative impact magnitude categories for assessing operational site noise

Impact Magnitude	Estimate of Impact
High	Rating levels significantly exceeding receptor background sound levels.
Medium	Rating levels moderately exceeding receptor background sound levels.
Low	Rating levels just exceeding receptor background sound levels.
Negligible	Rating levels equal to, or lower than, background sound levels.

14.8.33 The determination of significance will be calculated using the information provided in **Table 14.14** to determine the sensitivity of receptors, and the information in **Table 14.21** and professional judgement on the consideration of context to determine the magnitude of impact. This will then be compared to the significance of effect matrix provided in **Table 14.15** to determine the significance of effect.

14.9 Assessment of noise and vibration effects

Assessment of construction noise and vibration

14.9.1 This section reports the assessment of significance for temporary noise and vibration effects from the construction of the Project.

14.9.2 The assessment methodology set out in **Section 14.8** has been applied to predict indicative noise and vibration levels arising from the Project, where data is available.

Construction noise

14.9.3 A construction noise model has been created based on the reasonable worst-case scenario for each receptor (i.e. when the most activity is happening and/or the noisiest plant is operating within the vicinity of the receptor). A separate model has been created for daytime working hours and night-time working hours, which are set out in **Section 14.8**.

14.9.4 It is impossible to predict when activities may run over and need to be completed outside of core working hours due to safety or severe adverse weather conditions, or when highways works may be requested outside of core working hours. It is anticipated that oil processing, testing and commissioning and security monitoring will not give rise to significant noise levels. Due to this, the night-time model has focused on the jointing of underground cables (excluding cable cutting) and stringing (pulling of bonds over scaffolding) where required, as well as the 24/7 operation of the construction compounds.

14.9.5 Based on the construction programme (**Chapter 3, Volume 5, Document 5.2.3**, it has been determined that the busiest times for each construction area is as follows:

- Overton Substation area: period where temporary construction compound is in operation, main compound is being established, foundations for electrical equipment are being laid, troughing/ducting is taking place and the control building is being constructed;
- Monk Fryston Substation area: period where temporary construction compound is in operation, main compound is being established, foundations for electrical equipment are being laid, troughing/ducting is taking place and the control building is being constructed;
- Tadcaster CSEC area: period where temporary construction compound is in operation, the main compound is being established, foundations for electrical equipment are being laid, and HDD works are taking place; and
- Shipton-Tee CSEC area: period where temporary construction compound is in operation, main compound is being established and foundations for electrical equipment are being laid.

14.9.6 It has also been assumed that the stringing activities are taking place at the same time as the above.

14.9.7 **Appendix 14B** (**Volume 5, Document 5.3.14B**) contains the plant and activity assumptions used during the modelling process.

14.9.8 **Table 14.22** displays the predicted construction noise levels for daytime (core hours) and night-time (outside of core hours) activities, with the assumption that all activities listed in paragraph 14.9.5 are taking place at the same time as a reasonable worst-case scenario, and the difference between the threshold levels (shown in **Table 14.16**). A red value depicts an exceedance of the threshold levels, whilst blue shows compliance.

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Table 14.22 – Predicted construction noise levels and comparison to thresholds

Receiver	Daytime (core hours) level	Monday – Friday 07:00 – 19:00 Saturday 07:00 – 13:00 threshold limit difference	Monday- Friday 19:00 – 23:00 Saturday 13:00 – 23:00 Sunday 07:00 – 23:00 threshold limit difference	Night-time (outside of core hours) level	Monday – Sunday 23:00 – 07:00 threshold limit difference
HAM01	47	-18	-8	43	-2
HAM02	47	-18	-8	43	-3
HAM03	50	-15	-5	46	1
HAM04	52	-13	-3	46	1
HAM05	54	-11	-1	48	3
HAM06	55	-10	0	36	-9
HAM07	53	-12	-2	46	1
HAM08	58	-7	3	48	3
HAM09	56	-9	1	45	0
HAM10	48	-17	-7	44	-1
HAM11	53	-12	-2	46	1
HAR01	58	-7	3	54	9
HAR02	51	-14	-4	45	0

Receiver	Daytime (core hours) level	Monday – Friday 07:00 – 19:00 Saturday 07:00 – 13:00 threshold limit difference	Monday- Friday 19:00 – 23:00 Saturday 13:00 – 23:00 Sunday 07:00 – 23:00 threshold limit difference	Night-time (outside of core hours) level	Monday – Sunday 23:00 – 07:00 threshold limit difference
HAR03	60	-5	5	49	4
HAR04	52	-13	-3	52	7
HAR05	55	-10	0	56	11
HAR06	61	-5	6	32	-13
HAR07	54	-11	-1	31	-14
HAR08	53	-12	-2	54	9
SEL01	51	-14	-4	52	7
SEL02	46	-19	-9	41	-4
SEL03	58	-7	3	38	-7
SEL04	50	-15	-5	43	-2
SEL05	52	-13	-3	49	4
SEL06	51	-14	-4	43	-2
SEL07	47	-18	-8	43	-2
SEL08	54	-11	-1	51	6
SEL09	67	2	12	65	20

Receiver	Daytime (core hours) level	Monday – Friday 07:00 – 19:00 Saturday 07:00 – 13:00 threshold limit difference	Monday- Friday 19:00 – 23:00 Saturday 13:00 – 23:00 Sunday 07:00 – 23:00 threshold limit difference	Night-time (outside of core hours) level	Monday – Sunday 23:00 – 07:00 threshold limit difference
SEL10	56	-9	1	56	11
SEL11	53	-12	-2	53	8
SEL12	45	-20	-10	47	2
SEL13	45	-21	-11	48	3
SEL14	37	-28	-18	37	-8
SEL15	49	-16	-6	37	-8
SEL16	81	16	26	52	7
SEL17	77	12	22	51	6
SEL18	48	-17	-7	35	-10
SEL19	62	-3	7	47	2
SEL20	57	-8	2	40	-5
SEL21	54	-11	-1	38	-7
SEL22	55	-10	0	36	-9
SEL23	46	-19	-9	33	-12
YOR01	54	-11	-1	38	-7

Receiver	Daytime (core hours) level	Monday – Friday 07:00 – 19:00 Saturday 07:00 – 13:00 threshold limit difference	Monday- Friday 19:00 – 23:00 Saturday 13:00 – 23:00 Sunday 07:00 – 23:00 threshold limit difference	Night-time (outside of core hours) level	Monday – Sunday 23:00 – 07:00 threshold limit difference
YOR02	52	-13	-3	37	-8
YOR03	58	-7	3	50	5
YOR04	55	-11	-1	50	5
YOR05	56	-9	1	54	9
YOR06	52	-13	-3	49	4
YOR07	54	-11	-1	53	8
YOR08	55	-10	0	50	5
YOR09	45	-20	-10	9	-36
YOR10	48	-17	-7	8	-37
YOR11	46	-19	-9	11	-34
YOR12	46	-19	-9	11	-34

14.9.9 **Table 14.22** shows the majority of receptors, with the exception of SEL09, SEL16, and SEL17, are below the Monday – Friday 07:00 – 19:00 and Saturday 07:00 – 13:00 threshold. As the receptors are of medium sensitivity, the effects are **not significant**.

14.9.10 SEL09 experiences a very small (2dB) exceedance of the 65dB threshold, which equals a low magnitude of impact. The effects are determined as **not significant**. SEL16 and SEL17 experience construction levels much higher than the 65dB threshold level and is therefore a high magnitude of change (**Table 14.18**). This is **significant**.

14.9.11 **Table 14.22** shows that the majority of receptors, with the exception of HAM08, HAM09, HAR01, HAR03, HAR06, SEL03, SEL09, SEL10, SEL16, SEL17, SEL19, SEL20, YOR03 and YOR05 are below the Monday – Friday 19:00 – 23:00, Saturday 13:00 – 23:00 and Sunday 07:00 – 23:00 threshold.

14.9.12 HAM08, HAM09, HAR01, SEL03, SEL10, SEL20, YOR03 and YOR05 experience small (less than 5dB) exceedances of the 55dB threshold, which equals a low magnitude of impact. It is therefore determined that for these receptors, the effects are **not significant**.

14.9.13 HAR03, HAR06 and SEL19 experience a moderate (5 - 10dB) exceedance of the 55dB threshold, which equals a medium magnitude of impact. For these receptors, effects are **potentially significant**.

14.9.14 SEL09, SEL16, and SEL17 experience construction levels much higher than the threshold level (more than 10dB), which equals a high magnitude of impact. This determines that for these receptors the effects are **significant**.

14.9.15 **Table 14.22** shows that approximately half of receptors are predicted to experience exceedances of the 45dB threshold during the night-time (23:00 – 07:00 Monday – Sunday). Twelve experience small (less than 5dB) exceedances, 13 experience medium (5 – 10dB) exceedances, whilst 3 experience high (greater than 10dB) exceedances. Those that experience small exceedances are deemed **not significant**, those that experience medium exceedances are deemed **potentially significant** whilst those that experience high exceedances are deemed **significant**.

14.9.16 In reality, all activities modelled would not take place at the same time, despite the larger scale activities overlapping. Therefore, the source contribution breakdown (presented in **Appendix 5.3.14C, Volume 5, Document 5.3.14C**), has been examined to determine whether the highest contributing sources are happening at the same time. **Table 14.23** - **Table 14.25** display the results of this investigation for the three different threshold periods.

14.9.17 Annex E of BS 5228-1:2009+A1:2014[23] states that:

"Noise insulation, or the reasonable costs thereof, will be offered by the developer or promoter to owners, where applied for by owners or occupiers, subject to meeting the other requirements of the proposed scheme, where the construction of the development causes, or is expected to cause, a measured or predicted airborne construction noise level that exceeds either of the following at property lawfully occupied as a permanent dwelling:

- *the noise insulation trigger presented in Table E.2 for the corresponding times of day;*
- *a noise level 5dB or more above the pre-construction ambient noise level for the corresponding times of day;*

whichever is the higher;

and for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months".

14.9.18 The temporal guidance from Annex E is considered in the magnitude of impact from works at sensitive receptors in **Table 14.23** - **Table 14.25** and therefore, the time-limiting factor described above is used to determine significance. Where there are potential significant adverse impacts from construction noise either from a single activity or from accumulation of Project construction activities, the actual noise levels experienced at NSRs will need to be monitored during the construction phase. This is addressed in the **CoCP** (**Volume 5, Document 5.3.3B**).

Table 14.23 – Investigation into construction noise exceedances: Monday – Friday 07:00 – 19:00, Saturday 07:00 – 13:00

Receptor	Predicted level	Predicted 65dB threshold exceedance	Investigation results	Resulting significance
SEL09	67	2	No activities are predicted to exceed the 65dB threshold. The four activities with the highest noise contributions are: • HDD crossing (65dB); • pylon ID XC481 stringing (61dB); • establishing the main compound for Tadcaster Tee East (57dB); and • foundations for electrical equipment at Tadcaster Tee East (56dB). Significant effects will occur whilst HDD work is undertaken. It is understood that the length of noisy HDD works is to be shorter than the temporal criteria explained in paragraph 14.9.17, and therefore the effects are considered **not significant**.	**Significant** effects will occur whilst HDD work is undertaken. It is understood that the length of noisy HDD works is to be shorter than the temporal criteria explained in paragraph 14.9.17, and therefore the effects are considered **not significant**.
SEL16	81	16	Two activities are predicted to exceed the 65dB threshold: • construction of new pylon ID XC522 (80dB); and • pylon ID XC522 stringing (74dB). All other activities fall below 65dB, with the next highest activity being the demolition of the existing pylon ID XC522T at 60dB. According to the construction programme, the erection of pylon ID XC522 is due to have a duration of 9 days.	**Significant** effects are predicted only whilst work is conducted on pylon ID XC522, however, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.
SEL17	77	12	Two activities are predicted to exceed the 65dB threshold: • dismantling existing pylon ID XC522T (76dB). • pylon ID XC522 stringing (69dB) All other activities fall below 65dB, with the next highest activity being the new build pylon 32 at 65dB.	**Significant** effects are predicted only whilst work is conducted on dismantling existing pylon ID XC522T, however, due to the activity duration being lower than the temporal criteria explained in

Receptor	Predicted level	Predicted 65dB threshold exceedance	Investigation results	Resulting significance
			According to the construction programme, the dismantling of pylon IDs XC522T, XC523AT and XC524AT is to have a duration of 8 days.	paragraph 14.9.17, this is reduced to **not significant**.

Table 14.24 – Investigation into construction noise exceedances: Monday – Friday 19:00 – 23:00, Saturday 13:00 – 23:00, Sunday 07:00 – 23:00

Receptor	Predicted level	Predicted 55dB threshold exceedance	Investigation results	Resulting significance
HAM08	58	3	One activity is predicted to exceed the 55dB threshold: • new Overton Substation TCC (57dB) All other activities fall below 55dB, with the next highest activity being the foundation of electrical equipment at Overton at 43dB.	Predicted noise level exceeds the threshold, however due to being a low magnitude of impact, the effects are considered **not significant**.
HAM09	56	1	One activity is predicted to exceed the 55dB threshold: • new Overton Substation TCC (56dB) All other activities fall below 55dB, with the next highest activity being the foundation of electrical equipment at Overton at 41dB.	Predicted noise level exceeds the threshold, however due to being a low magnitude of impact, the effects are considered **not significant**.
HAR01	58	3	No single activity is predicted to exceed the 55dB threshold. The three activities with highest noise levels are: • pylon ID XC429 stringing (54dB); • new build pylon ID XC429 (53dB); and • dismantling of pylon ID XC428 (50dB).	Effects are predicted to be **not significant** when stringing of pylon ID XC429 is separate from other construction activities.

Receptor	Predicted level	Predicted 55dB threshold exceedance	Investigation results	Resulting significance
			Separating the stringing of pylon ID XC429 from other activities brings the predicted level below the threshold.	If stringing works at pylon ID XC429 are to take place at the same time as other nearby construction activities, it is understood that the duration of the activity will be lower than the temporal criteria explained in paragraph 14.9.17, and therefore the effect is reduced to **not significant**.
HAR03	60	5	One activity is predicted to exceed the 55dB threshold: • building temporary pylon ID XCP005T (56dB). All other activities fall below 55dB, with the next highest activity being building new pylon ID XC424 (55dB). The combination of both activities occurring simultaneously is 58dB.	Effects are predicted to be **significant**. Due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.
HAR06	61	6	Stringing activity for pylon ID XC446 is predicted to exceed the 55dB threshold, however the model currently assumes that all stringing equipment will be required on both sides of Tockwith Road at the same time, producing levels of 58dB and 57dB at the receptor. Assuming stringing equipment will only be required on one side of the road at a time, predicted noise levels will fall below the threshold. In any case, the operation will be completed in two to three single night periods separated by months of inactivity and fall below the temporal criteria explained in paragraph 14.9.17.	Effects are predicted to be **not significant**.

Receptor	Predicted level	Predicted 55dB threshold exceedance	Investigation results	Resulting significance
SEL03	58	3	One activity is predicted to exceed the 55dB threshold: • pylon ID XC475 stringing (59dB). The operation will be completed in two to three single night periods separated by months of inactivity, and fall below the temporal criteria explained in paragraph 14.9.17.	Predicted noise level exceeds the threshold, however due to being a low magnitude of impact, the effects are considered **not significant**.
SEL09	67	12	Four activities are predicted to exceed the 55dB threshold: • horizontal directional drilling (HDD) works (65dB); • pylon ID XC481 stringing (61dB); • establishing the main Tadcaster Tee East CSEC compound (58dB); and • installing foundations for electrical equipment at Tadcaster Tee East CSEC (58dB). The model currently assumes that the HDD entry pit will be located closest to receptors. If this is moved to the opposite side, the predicted noise level will be lower. According to the construction programme, the HDD works are due to take place during June 2026 (for a period of 20 days, though it is understood 'noisy' works will only take place for a few days), and the stringing of pylon ID XC481 is due to take place in June 2027 (for a period of 3 days).	**Significant** effects are predicted during the HDD works and pylon ID XC481 stringing. Due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**. **Significant** effects are predicted during establishing and foundation works at the Tadcaster Tee East CSEC.
SEL10	56	1	One activity is predicted to exceed the 55dB threshold: • horizontal directional drilling (HDD) works (56dB). The model currently assumes that the HDD entry pit will be located closest to receptors. If this is moved to the opposite side, the predicted noise level will be lower. According to the construction programme, the HDD works are due to take place during June 2026.	Predicted noise level exceeds the threshold, however due to being a low magnitude of impact, the effects are considered **not significant**.

Receptor	Predicted level	Predicted 55dB threshold exceedance	Investigation results	Resulting significance
SEL16	81	26	Three activities are predicted to exceed the 55dB threshold: • construction of new pylon ID XC522 (80dB); • pylon ID XC522 stringing (74dB); and • dismantling of pylon ID XC522T (60dB) All other activities fall below 55dB, with the activity with the highest noise level being the stringing of pylon ID XC521 at 53dB. According to the construction programme, the dismantling of pylon IDs XC522T, XC523AT and XC524AT is to take place at the same time as the pylon ID XC522 stringing and is expected to last 8 days during October 2026. The construction of pylon ID XC522 is expected to take 9 days during August 2026.	**Significant** effects are predicted only whilst work is conducted on pylon ID XC522, however, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this can be reduced to **not significant**.
SEL17	77	22	Three activities are predicted to exceed the 55dB threshold: • dismantling existing pylon ID XC522T (76dB); • pylon ID XC522 stringing (69dB); and • construction of new pylon ID XC522 (65dB). All other activities fall below 55dB, with the next highest activity being the stringing of pylon ID XC521 at 48dB. According to the construction programme, the dismantling of pylon IDs XC522T, XC523AT and XC524AT is to take place at the same time as the pylon ID XC522 stringing and is expected to last 8 days during October 2026. The construction of pylon ID XC522 is expected to take 9 days during August 2026.	**Significant** effects are predicted only whilst work is conducted on dismantling existing pylon ID XC522T and constructing and stringing new pylon ID XC522. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.
SEL19	62	7	Two activities are predicted to exceed the 55dB threshold, with the loudest activities being: • pylon ID XC524 stringing (56dB); and	Effects are predicted to be **significant**. However, due to the activity duration being

Receptor	Predicted level	Predicted 55dB threshold exceedance	Investigation results	Resulting significance
			• Constructing new pylon ID XC524 (56dB); The construction of pylon ID XC524 is expected to take 9 days, whilst stringing is expected to take 2 days.	lower than the temporal criteria explained in paragraph 14.9.17, this can be reduced to **not significant**.
SEL20	57	2	No single activity is predicted to produce a level above the 55dB threshold. The highest contributors are: • Monk Fryston Substation temporary construction compounds (55dB and 48dB). Both compounds will be required throughout the construction programme and will be required to operate at the same time, and therefore the exceedance is predicted.	Predicted noise level exceeds the threshold, however due to being a low magnitude of impact, the effects are considered **not significant**.
YOR03	58	3	No single activity is predicted to produce a level above the 55dB threshold, however there are several activities that are predicted to produce levels between 40 and 50dB. The combination of all these activities occurring at once would lead to an exceedance. The highest contributors are: • Shipton-Tee CSEC temporary construction compound (50dB and 47dB); • building temporary pylon ID YR038T (50dB); • establishing main compound for Shipton south CSEC (47dB); • stringing activities at pylon ID YN001; • establishing foundations for electrical equipment at Shipton South CSEC (46dB); • establishing main compound for Shipton North CSEC (46dB); and	Predicted noise level exceeds the threshold, however due to being a low magnitude of impact, the effects are considered **not significant**.

Receptor	Predicted level	Predicted 55dB threshold exceedance	Investigation results	Resulting significance
			• establishing foundations for electrical equipment at Shipton North CSEC (46dB). In reality, these activities will not overlap and therefore the threshold will not be exceeded.	
YOR05	56	1	No single activity is predicted to produce a level above the 55dB threshold, however there are several activities that are predicted to produce levels between 42 and 52dB. The combination of all these activities occurring at once would lead to an exceedance: • stringing activities at YN004 (52dB); • building pylon ID YN004 (50dB); • stringing activities at YN005 (45dB); • building pylon ID YN003 (43dB); • temporary construction compound for Shipton CSECs (42dB); and • building pylon ID YN005 (42dB). In reality, these activities will not overlap (stringing would not occur at the same time as building a pylon, for example), and therefore the threshold will not be exceeded.	Predicted noise level exceeds the threshold, however due to being a low magnitude of impact, the effects are considered **not significant**.

Table 14.25 – Investigation into construction noise exceedances: Monday – Sunday 23:00 – 07:00

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
HAM03	46	1	No single activity is predicted to produce a level above the 45dB threshold. The highest contributors are: • pulling bonds over scaffold closest to pylon ID 2TW169 (44dB); • pulling bonds over scaffold closest to pylon ID YN001 (39dB); and • underground cut and fill (38dB). The underground cut and fill is due to take place during May / June 2025, pulling bonds over scaffold closest to pylon ID YN001 between August – October 2025 and pulling bonds over scaffold closest to pylon ID 2TW169 during July – August 2026, and therefore none of the above activities will overlap.	None of the highest contributing activities will overlap with each other, resulting in levels continuously below the threshold, and therefore the effects are likely to be **not significant**.
HAM04	46	1	No single activity is predicted to produce a level above the 45dB threshold. The highest contributors are: • underground cut and fill (42dB); • pulling bonds over scaffold closest to pylon ID YN001 (41dB); and • pulling bonds over scaffold closest to pylon ID 2TW169 (39dB). The underground cut and fill is due to take place during May/June 2025, pulling bonds over scaffold closest to pylon ID YN001 between August – October 2025 and the pulling bonds over scaffold	None of the highest contributing activities will overlap with each other, resulting in levels continuously below the threshold, and therefore the effects are likely to be **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			closest to pylon ID 2TW169 during July – August 2026, and therefore none of the above activities will overlap.	
HAM05	48	3	One activity is predicted to produce a level above the 45dB threshold: • pulling bonds over scaffold closest to pylon ID YN001 (46dB) The next highest contributor is underground cut and fill at 38dB.	**Significant** effects are predicted whilst the pulling bonds over scaffold closest to pylon ID YN001 is taking place. However, it is understood that the activity duration will be lower than the temporal criteria explained in paragraph 14.9.17, and therefore this is reduced to **not significant**.
HAM07	46	1	No single activity is predicted to produce a level above 45dB, with the highest contributors being: • pulling bonds over scaffold closest to pylon ID YN008 (41dB); and The pulling bonds over scaffold closest to pylon ID YN008 is expected to take place during August – October 2025	As the activities with the highest contributions to noise levels at the receptor are not expected to overlap, the effect is predicted to be **not significant** as levels will continuously be under the threshold.
HAM08	48	3	No single activity is predicted to produce a level above 45dB, with the highest contributors being: • pulling bonds over scaffold closest to pylon ID YN008 (43dB); and The pulling bonds over scaffold closest to pylon ID YN008 is expected to take place during August – October 2025.	As the activities with the highest contributions to noise levels at the receptor are not expected to overlap, the effect is predicted to be **not significant** as levels will continuously be under the threshold.
HAM11	46	1	No single activity is predicted to produce a level above 45dB, with the highest contributors being:	As the two activities with the highest contributions to noise levels at the receptor are not expected to overlap, the effect is

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			• pulling bonds over scaffold closest to pylon ID SP006 (41dB); • pulling bonds over scaffold closest to pylon ID SP007 (40dB); and • pulling bonds over scaffold closest to pylon ID SP004 (38dB). The pulling bonds over scaffold closest to pylon IDs SP006 and SP007 is expected to take place during April 2026, whilst the pulling bonds over scaffold closest to pylon ID SP004 is expected April 2027. As the activities with the highest contributions will not overlap, the effects can be considered not significant.	predicted to be **not significant** as levels will continuously be under the threshold.
HAR01	54	9	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC429 (54dB). All other activities fall below 30dB and therefore the 45dB threshold will not be exceeded outside of the period where the pulling bonds over scaffold closest to pylon ID XC429 is taking place.	**Significant** effects are predicted whilst pulling bonds over scaffold closest to pylon ID XC429 works take place. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.
HAR03	49	4	One activity is predicted to exceed 45dB, with the highest contributors being: • pulling bonds over scaffold closest to pylon ID XC425 (48dB); and • pulling bonds over scaffold closest to pylon ID XC422 (42dB).	**Significant** effects are predicted whilst pulling bonds over scaffold closest to pylon ID XC425 works take place. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			The pulling bonds over scaffold closest to pylon ID XC425 is expected to take place between April – May 2026, whilst the pulling bonds over scaffold closest to pylon ID XC422 is expected during June 2026. As the highest contributing activities do not overlap with each other, the predicted noise levels will always fall below 45dB.	
HAR04	52	7	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC435 (50dB and 48dB). The model currently assumes all equipment is located on both sides of the railway (i.e. there is two lots of the same equipment). It is assumed that, in reality, the equipment will be split across the two locations or located on one side of the railway, with the other side empty.	If the equipment is kept solely to the north side of the railway during the pulling bonds over scaffold closest to pylon ID XC435, there will be a slight (1dB exceedance) and therefore the effects are predicted to be **significant**. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.
HAR05	56	11	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC435 (53dB and 52dB). The model currently assumes all equipment is located on both sides of the railway (i.e. there is two lots of the same equipment). It is assumed that, in reality, the equipment will be split across the two locations or located on one side of the railway, with the other side empty. Therefore the maximum predicted level would be approximately 53dB and still exceed the night-time threshold.	Effects are considered **significant** whilst pulling bonds over scaffold closest to pylon ID XC435 works take place. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
HAR08	54	9	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC451 (54dB). All other activities are 27dB or less, and therefore 45dB threshold would not be exceeded outside of this period.	Effects are considered **significant** whilst pulling bonds over scaffold closest to pylon ID XC451 works take place. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.
SEL01	52	7	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC473 (52dB). All other activities are 26dB or less, and therefore 45dB threshold would not be exceeded outside of this period.	Effects are considered **significant** whilst pulling bonds over scaffold closest to pylon ID XC473 works take place. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.
SEL05	49	4	One activity is predicted to exceed the 45dB threshold: • HDD entry pit (49dB). The drilling part of the HDD works is anticipated to take 5 days during June 2026. The noise making equipment leading to exceedance during night is mainly mud pumps required to prevent collapse of drilled cavity and generation plant. No drilling is anticipated to be carried out at night. The next highest contributor is the pulling bonds over scaffold closest to pylon ID XC481 (44dB). This is expected to last for a period of 3 days and overlap with the HDD works.	**Significant** effects are predicted during the HDD works. Given the activity duration is lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**. All other activities are not expected to exceed the 45dB threshold, and the effects are therefore predicted to be **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
SEL08	51	6	One activity is predicted to exceed the 45dB threshold: • HDD entry pit (51dB); and The drilling part of the HDD works is anticipated to take 5 days during June 2026. The noise making equipment leading to exceedance during night is mainly mud pumps required to prevent collapse of drilled cavity and generation plant. No drilling is anticipated to be carried out at night.	**Significant** effects are predicted during the HDD drilling. However, as the 'noisy' works duration is lower than the temporal criteria explained in paragraph 14.9.17, the effect is considered **not significant**. All other activities are not expected to exceed the 45dB threshold, and the effects are therefore likely to be **not significant**.
SEL09	65	20	One activity is predicted to exceed the 45dB threshold: • HDD entry pit (65dB); and The drilling part of the HDD works is anticipated to take 5 days during June 2026. The noise making equipment leading to exceedance during night is mainly mud pumps required to prevent collapse of drilled cavity and generation plant. No drilling is anticipated to be carried out at night.	**Significant** effects are predicted during the HDD drilling. Given the activity duration is lower than the temporal criteria explained in paragraph 14.9.17, the effect is considered **not significant**. All other activities are not predicted to exceed the 45dB threshold, and the effects are therefore predicted to be **not significant**.
SEL10	56	11	One activity is predicted to exceed the 45dB threshold: • HDD entry pit (56dB). The drilling part of the HDD works is anticipated to take 5 days during June 2026. The noise making equipment leading to exceedance during night is mainly mud pumps required to prevent collapse of drilled cavity and generation plant. No drilling is anticipated to be carried out at night.	**Significant** effects are predicted during the HDD drilling. Given the activity duration is lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**. All other activities are not predicted to exceed the 45dB threshold, and the effects are therefore predicted to be **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			2026.	
SEL11	53	8	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC486 (53dB). All other activities are predicted to give rise to noise levels of 38dB or less at the receptor, and therefore the threshold is not predicted to be exceeded throughout the rest of construction.	**Significant** effects are predicted during the pulling bonds over scaffold closest to pylon ID XC486 works, however, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**. All other activities are not predicted to exceed the 45dB threshold and therefore the effects are predicted to be **not significant**.
SEL12	47	2	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC494 (47dB). All other activities are predicted to give rise to noise levels of 25dB or less at the receptor, and therefore the threshold is not predicted to be exceeded throughout the rest of construction.	**Significant** effects are predicted during the pulling bonds over scaffold closest to pylon ID XC494 works, however, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**. All other activities are not predicted to exceed the 45dB threshold and therefore the effects are predicted to be **not significant**.
SEL13	48	3	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC505 (47dB). All other activities are predicted to give rise to noise levels of 23dB or less at the receptor, and	**Significant** effects are predicted during the pulling bonds over scaffold closest to pylon ID XC505 works, however, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**. All other activities are not predicted to exceed the 45dB threshold and therefore

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			therefore the threshold is not predicted to be exceeded throughout the rest of construction.	the effects are predicted to be **not significant**.
SEL16	52	7	Three activities are predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC521 (49dB); and • pulling bonds over scaffold closest to pylon ID XC523 (47dB). The pulling bonds over scaffold closest to pylon IDs XC521 and XC523 is due to take place for 8 days in October 2026. The effect is therefore **significant**, though only for a short period of time.	**Significant** effects are predicted during the pulling bonds over scaffold closest to pylon IDs XC521 and XC523 works, however, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**. All other activities are not predicted to exceed the 45dB threshold and therefore the effects are predicted to be **not significant**.
SEL17	51	6	Two activities are predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC521 (49dB); and • pulling bonds over scaffold closest to pylon ID XC523 (48dB). The pulling bonds over scaffold closest to pylon IDs XC521 and XC523 is due to take place for 8 days in October 2026. The effect is therefore **significant**, though only for a short period of time.	**Significant** effects are predicted during the pulling bonds over scaffold closest to pylon IDs XC521 and XC523 works, however, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**. All other activities are not predicted to exceed the 45dB threshold and therefore the effects are predicted to be **not significant**.
SEL19	47	2	One activity are predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC523 (46dB).	**Significant** effects are predicted during the pulling bonds over scaffold closest to pylon ID XC523 works, however, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			The pulling bonds over scaffold closest to pylon ID XC523 is due to take place for 8 days in October 2026 and therefore, due to the short duration, the effects can be considered **not significant**.	All other activities are not predicted to exceed the 45dB threshold and therefore the effects are predicted to be **not significant**.
YOR03	50	5	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID YN001 (47dB). The underground line cut and fill is the next highest contributor (43dB). The pulling bonds over scaffold closest to pylon ID YN001 is due to take place between August – October 2025, whilst the underground cut and fill is June 2026. Therefore, as the two biggest activities do not overlap each other, the threshold of 45dB is not predicted to be exceeded throughout the construction period.	As the biggest contributors to the modelled result are not expected to overlap, the effects are predicted to be **not significant** as it is unlikely that the 45dB threshold would not be exceeded.
YOR04	50	5	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID YN004 pulling bonds over scaffold (48dB). Pulling bonds over scaffold closest to pylon ID YN005 is the next highest contributor (42dB). The pulling bonds over scaffold closest to pylon IDs YN004 and YN005 is expected to take place at the same time, so has the potential to cause **significant** effects. The pulling bonds over scaffold closest to pylon IDs YN004 and YN005 is	**Significant** effects are predicted during the pulling bonds over scaffold closest to pylon ID YN004 works, however, the activity is confirmed to only take place over a handful of evenings and therefore the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			expected to last for a period of 29 days between August and October 2026.	
YOR05	54	9	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID YN004 (53dB). The pulling bonds over scaffold closest to the pylon is due to take place for 29 days between August and October 2026.	**Significant** effects are predicted during the pulling bonds over scaffold closest to pylon ID YN004 works, however, the activity is confirmed to only take place over a handful of evenings and therefore the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant.**
YOR06	49	4	No single activity is predicted to exceed the 45dB threshold. The highest contributors and expected durations are: • pulling bonds over scaffold closest to pylon ID SP004 (43dB and 42dB). Expected to have a duration of 14 days between April and May 2025; • pulling bonds over scaffold closest to pylon ID SP006 (41dB). Expected to have a duration of 14 days between April and May 2025; • pulling bonds over scaffold closest to pylon ID SP007 (37dB). Expected to have a duration of 6 days during April 2026; • pulling bonds over scaffold closest to pylon ID XC416 (41dB). Expected to have a duration of 10 days during May 2025;	Whilst no single activity exceeds the 45dB threshold, there are several activities contributing similar noise levels, which when combined, exceed the threshold. When looking at the planned construction dates, whilst there is some overlap, there are also some activities listed which happen in isolation to the others. It is therefore unlikely that the 45dB threshold will be exceeded during the construction period and the effects can be considered **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			• troughing / ducting at Overton Substation (40dB). Expected to have a duration of 64 days between March and July 2025; and • pulling bonds over scaffold closest to pylon ID YN008 (39dB). Expected to have a duration of 29 days between August and October 2025. The model currently assumes that there are two pulling bonds over scaffold areas closest to pylon ID SP004 and the equipment is located in both locations at the same time (i.e. there are two of every plant item). If the equipment is split over the two locations, or located in just one, then the resultant noise level will be lower. Whilst there is some overlap of activities (such as pulling bonds over scaffold closest to pylon IDs SP004 and SP006 and troughing / ducting work happening at Overton Substation), it is unlikely that the 45dB limit will be exceeded.	
YOR07	53	8	Two activities are predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID SP007 (52dB); and • pulling bonds over scaffold closest to pylon ID SP006 (48dB) The pulling bonds over scaffold closest to pylon ID SP007 is expected to last for 6 days during April 2026, whilst pulling bonds over scaffold closest to pylon ID SP006 is expected to last for 14 days	Whilst the pulling bonds over scaffold closest to pylon ID SP007 works are taking place, the threshold is exceeded and therefore the effects are predicted to be **significant**. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.

Receptor	Predicted level	Predicted 45dB threshold exceedance	Investigation results	Resulting significance
			over April – May 2025. The two pulling bonds over scaffold works are not expected to overlap. As the two highest contributors do not overlap, and the pulling bonds over scaffold closest to pylon ID SP007 has a short duration, the effects can be considered **not significant**.	
YOR08	50	5	One activity is predicted to exceed the 45dB threshold: • pulling bonds over scaffold closest to pylon ID XC422 (50dB). All other activities are predicted to give rise to noise levels of 35dB or less.	Whilst the pulling bonds over scaffold closest to pylon ID XC422 works are taking place, the effects are predicted to be **significant**. However, due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, this is reduced to **not significant**.

14.9.19 After reviewing the source breakdown and temporal criteria, an assessment for the placement of barriers has been undertaken. This is presented in **Appendix 5.3.14D** (**Volume 5, Document 5.3.14D**).

14.9.20 In general:

- where predicted levels are above the threshold value, screening of equipment, or use of acoustic shrouding of the noisiest activities is required;
- where night-time works are required and are within 350 m of a residential receptor screening of equipment, or use of acoustic shrouding of the noisiest activities is required;
- where predicted levels are smaller than 10dB below the threshold value no screening is required or recommended for the activity.
- HDD areas are included on the basis that mud-pumps are required to be used overnight to prevent collapse of horizontal bores, however, if plant is not required at night, screening is not needed.

14.9.21 The predicted overall receptor levels when required barriers are in place are presented in **Table 14.26**.

Table 14.26 – Predicted construction noise levels and comparison to thresholds with inclusion of acoustic screening, where required

Receiver	Daytime (core hours) level	Monday – Friday 07:00 – 19:00 Saturday 07:00 – 13:00 threshold limit difference	Saturday 13:00 – 23:00 Sunday 07:00 – 23:00 threshold limit difference	Night-time (outside of core hours) level	Monday – Sunday 23:00 – 07:00 threshold limit difference
HAM01	47	-18	-8	43	-2
HAM02	46	-19	-9	43	-3
HAM03	49	-16	-6	46	1
HAM04	51	-14	-4	46	1
HAM05	53	-12	-2	47	2
HAM06	51	-14	-4	36	-9
HAM07	51	-14	-4	45	0
HAM08	54	-11	-1	46	1
HAM09	53	-12	-2	44	-1
HAM10	48	-17	-7	44	-1
HAM11	53	-12	-2	46	1
HAR01	58	-7	3	54	9
HAR02	51	-14	-4	45	0
HAR03	57	-8	2	49	4

Receiver	Daytime (core hours) level	Monday – Friday 07:00 – 19:00 Saturday 07:00 – 13:00 threshold limit difference	Saturday 13:00 – 23:00 Sunday 07:00 – 23:00 threshold limit difference	Night-time (outside of core hours) level	Monday – Sunday 23:00 – 07:00 threshold limit difference
HAR04	52	-13	-3	52	7
HAR05	55	-10	0	56	11
HAR06	56	-9	1	32	-13
HAR07	50	-15	-5	31	-14
HAR08	53	-12	-2	54	9
SEL01	51	-14	-4	52	7
SEL02	46	-20	-10	41	-4
SEL03	54	-11	-1	38	-7
SEL04	48	-17	-7	42	-3
SEL05	50	-15	-5	47	2
SEL06	51	-14	-4	43	-2
SEL07	45	-20	-10	41	-4
SEL08	51	-14	-4	47	2
SEL09	62	-3	7	61	16
SEL10	52	-13	-3	52	7
SEL11	53	-12	-2	53	8

Receiver	Daytime (core hours) level	Monday – Friday 07:00 – 19:00 Saturday 07:00 – 13:00 threshold limit difference	Saturday 13:00 – 23:00 Sunday 07:00 – 23:00 threshold limit difference	Night-time (outside of core hours) level	Monday – Sunday 23:00 – 07:00 threshold limit difference
SEL12	45	-20	-10	47	2
SEL13	45	-21	-11	48	3
SEL14	37	-28	-18	37	-8
SEL15	48	-17	-7	37	-8
SEL16	81	16	26	49	4
SEL17	75	10	20	50	5
SEL18	47	-18	-8	34	-11
SEL19	58	-7	3	47	2
SEL20	53	-12	-2	38	-7
SEL21	51	-14	-4	36	-9
SEL22	52	-13	-3	36	-10
SEL23	45	-20	-10	33	-12
YOR01	51	-15	-5	38	-7
YOR02	49	-17	-7	37	-8
YOR03	57	-8	2	50	5
YOR04	53	-12	-2	49	4

Receiver	Daytime (core hours) level	Monday – Friday 07:00 – 19:00 Saturday 07:00 – 13:00 threshold limit difference	Saturday 13:00 – 23:00 Sunday 07:00 – 23:00 threshold limit difference	Night-time (outside of core hours) level	Monday – Sunday 23:00 – 07:00 threshold limit difference
YOR05	56	-9	1	54	9
YOR06	51	-14	-4	49	4
YOR07	54	-11	-1	54	9
YOR08	55	-10	0	50	5
YOR09	45	-20	-10	9	-36
YOR10	48	-17	-7	8	-37
YOR11	46	-19	-9	12	-33
YOR12	46	-19	-9	12	-33

14.9.22 **Table 14.26** shows the majority of receptors, with the exception of SEL16 and SEL17, are below the Monday – Friday 07:00 – 19:00 and Saturday 07:00 – 13:00 threshold. As the receptors are of medium sensitivity, the effects are **not significant**.

14.9.23 SEL16 and SEL17 are predicted to experience construction levels much higher than the 65dB threshold level and is therefore a high magnitude of change (**Table 14.18**) for high sensitivity receptors and is therefore **significant**. A review of the source breakdown from **Table 14.23** shows the activities causing these exceedances are the construction of new pylon ID XC522, the stringing of pylon ID XC522, and the dismantling of pylon ID XC522T. It is also explained that the duration of these activities fall below the temporal criteria explained in paragraph 14.9.17 and the effects are therefore **not significant**.

14.9.24 **Table 14.26** shows the majority of receptors, with the exception of HAR01, HAR03, HAR06, SEL09, SEL16, SEL17, SEL19, YOR03 and YOR05, are below the Monday – Friday 19:00 – 23:00, Saturday 07:00 – 13:00 and Sunday 07:00 – 23:00 threshold. As the receptors are of medium sensitivity, the effects are **not significant**.

14.9.25 HAR01, HAR03, HAR06, SEL19, SEL20, YOR03 and YOR05 experience small exceedances (less than 5dB) of the 55dB threshold, which equals a low magnitude of impact. A review of **Table 14.24** shows that the activities causing the exceedances will have durations lower than the temporal criteria explained in paragraph 14.9.17, or that no single activity exceeds the threshold and there will not be an overlap in activities that would cause an exceedance. The residual effects are therefore **not significant**.

14.9.26 SEL09 is predicted to experience a moderate (5 – 10dB) exceedance of the 55dB threshold, which equals a medium magnitude of impact, which is **potentially significant**. A review of the source breakdown from **Table 14.24** shows that **significant** effects are predicted during the HDD works and stringing of pylon ID XC481, however the activity durations are shorter than the temporal criteria explained in paragraph 14.9.17, and the effects are therefore **not significant**. **Table 14.24** also shows that **significant** effects are predicted during the establishing and foundation installing for the main Tadcaster Tee East CSEC site with no barriers installed, however with the required barriers in place, modelling shows the source contribution is predicted to be 53dB (as shown in **Appendix 5.3.14C, Volume 5, Document 5.3.14C**) for each of these activities, and as these activities will not overlap the effects are reduced to **not significant**.

14.9.27 SEL16 and SEL17 are predicted to experience construction levels much higher than the threshold level (more than 10dB), which equals a high magnitude of impact and therefore a **significant** effect. A review of the source breakdown from **Table 14.24** shows the activities causing these exceedances are the construction of new pylon ID XC522, the stringing of pylon ID XC522, and the dismantling of pylon ID XC522T. It is also explained that the duration of these activities fall below the temporal criteria explained in paragraph 14.9.17 and the effects are therefore **not significant**.

14.9.28 **Table 14.26** shows that approximately half of receptors are predicted to experience exceedances of the 45dB threshold during the night-time (23:00 – 07:00 Monday – Sunday). Fourteen experience small (less than 5dB) exceedances, 11 experience medium (5-10dB) exceedances, whilst 2 experiences high (greater than 10dB) exceedances. Those that experience small exceedances are deemed **not significant**, those that experience medium are deemed **potentially significant** whilst hose that experience high exceedances are deemed **significant**.

14.9.29 HAM03, HAM04, HAM05, HAM08, HAM11, HAR03, SEL05, SEL08, SEL12, SEL13, SEL16, SEL19, YOR04, and YOR06 all experience reductions in predicted levels when

required barriers are in place, and experience small (less than 5dB) exceedances of the 45dB threshold which equals a low magnitude of impact.

14.9.30 **Table 14.25** shows that for HAM03, HAM04, HAM08, HAM11 and YOR06 none of the highest contributing activities will overlap with each other, resulting in levels continuously below the threshold and therefore the effects are **not significant**.

14.9.31 **Table 14.25** also shows that for HAM05, HAR03, SEL05, SEL08, SEL12, SEL13, SEL16, SEL19 and YOR04 the activity durations fall under the temporal criteria explained in paragraph 14.9.17 and the effects are therefore **not significant**.

14.9.32 HAR01, HAR04, HAR08, SEL01, SEL10, SEL11, SEL17, YOR03, YOR05, YOR07 and YOR08 all experience reductions in predicted levels when required barriers are in place, and experience medium (5 – 10dB) exceedances of the 45dB threshold**,** which equals a **potentially significant** effect.

14.9.33 **Table 14.25** shows that, for these receptors, the activity durations fall under the temporal criteria explained in paragraph 14.9.17 and the effects are therefore **not significant**.

14.9.34 HAR05 and SEL09 experience reductions in predicted levels when required barriers are in place, and experience high (10dB or more) exceedances of the 45dB threshold, which equals a potentially **significant** effect.

14.9.35 **Table 14.25** shows that at both HAR05 and SEL09 the activity durations fall under the temporal criteria explained in paragraph 14.9.17 and the effects are therefore **not significant**.

14.9.36 The modelled results when both required and recommended barriers are installed are presented in **Appendix 5.3.14D** (**Volume 5, Document 5.3.14D**).

Construction road traffic noise

14.9.37 Significant effects due to construction traffic noise may occur at the nearest receptors adjacent to the vehicular routes associated with the construction of the Project.

14.9.38 In accordance with the guidance on Study Areas in paragraph 3.8 of DMRB LA111[33], the Study Area for construction traffic noise impacts is defined as 50m from the kerb of any road with a predicted increase in Basic Noise Level (BNL) of at least 1dB(A), which is considered to be the minimum perceivable increase in noise to the human ear.

14.9.39 Assessments of the increase in BNL are presented in **Table 14.27**. The magnitude of change has been derived from **Table 14.20**.

Table 14.27 – Predicted construction phase increase in traffic noise

Road	Receptor location	2022 baseline		2025 baseline + peak construction traffic		Predicted traffic noise increase, dB	Magnitude of change
		18-hour traffic flow	% HGV	18-hour traffic flow	% HGV		
A63	Between Rawfields Lane and A162	10164	11%	10506	12%	0.1	Negligible
A659	Between A64 and A659	9996	12%	10415	13%	0.2	Negligible
A64	Between Paradise Lane and A659	6042	4%	6483	7%	0.3	Negligible
Weatherby Road	Between Tower Crescent and Station Road	4453	1%	4587	1%	0.1	Negligible
A1237	Between Askham Bryan Lane and Borad Lane	11483	8%	11950	9%	0.2	Negligible
A59	Between Cat Lane and Newlands Lane	18549	4%	19257	5%	0.2	Negligible
Common Croft Lane	North of A59	128	1%	176	15%	1.4	Minor

Road	Receptor location	2022 baseline		2025 baseline + peak construction traffic		Predicted traffic noise increase, dB	Magnitude of change
		18-hour traffic flow	% HGV	18-hour traffic flow	% HGV		
A59	Between Low Road and Pool Lane	18549	4%	19216	5%	0.2	Negligible
A1237	Between A1237 and Esk Drive	38748	3%	39931	4%	0.1	Negligible
A19	Between Fairfields Drive and Stripe Lane	9945	6%	10400	7%	0.2	Negligible
Overton Road	Between Stripe Lane and A19	135	12%	181	26%	1.3	Minor
B1363	Between Mill Lane and A1237	9784	2%	10115	3%	0.1	Negligible
A1079	Between A64 and Osbaldwick Link Road	13854	2%	14210	2%	0.1	Negligible
A64	Between Common Lane and Forest Lane	50462	6%	51797	6%	0.1	Negligible

Road	Receptor location	2022 baseline		2025 baseline + peak construction traffic		Predicted traffic noise increase, dB	Magnitude of change
		18-hour traffic flow	% HGV	18-hour traffic flow	% HGV		
A63	Between Westfield Lane and A1246 Turn Off	10805	8%	11133	9%	0.1	Negligible
A168	Between A58 and Walton Road	11950	3%	12335	4%	0.1	Negligible
Church Lane	Church Lane – Wighill	448	7%	498	11%	0.5	Negligible
Osbaldwick Link Road	Between A1079 and Murton Way	3391	3%	3481	3%	0.1	Negligible
Station Road	Between A659 and Weatherby Road	2898	8%	3000	8%	0.2	Negligible
B1222	Church Hill – Sherburn in Elmet	4223	11%	4351	11%	0.1	Negligible
A1(M)	Between A659/A168 and A64	109614	16%	112853	16%	0.1	Negligible
A1(M)	Between A53 and M62	142918	14%	146650	15%	0.1	Negligible

Road	Receptor location	2022 baseline		2025 baseline + peak construction traffic		Predicted traffic noise increase, dB	Magnitude of change
		18-hour traffic flow	% HGV	18-hour traffic flow	% HGV		
M1	Between A63 and A1(M)	79965	10%	81994	10%	0.1	Negligible
A19	Shipton	11840	13%	12243	13%	0.1	Negligible
Church Lane	North of A59	371	1%	384	2%	0.2	Negligible

14.9.40 **Table 14.27** shows a 1dB increase on Common Croft Lane (north of A59). A review of aerial imagery shows there are no receptors within 50m of the kerb side of Common Croft Lane, and therefore the effects due to construction traffic noise are **not significant**.

14.9.41 **Table 14.27** shows a 1dB increase on Overton Road (between Stripe Lane and A19). Receptors within 50m of the kerb side of Overton Road will experience minor changes in noise levels, and therefore the effects due to construction traffic noise are **not significant**.

Construction vibration – Transmission route

14.9.42 Groundborne vibration attenuates rapidly with distance and is normally only a concern where percussive piling is to be undertaken in very close proximity to existing buildings or where particular vibration sensitive receptors need to be considered. It is understood that piling will be required for the construction of new pylons and gantries.

14.9.43 **Table 14.28** and **Table 14.29** show the predicted levels of vibration for percussive piling at the NSRs within 300m, based on the distance between the receptor and closest new build pylon or gantry, in accordance with guidance and criteria given in BS 5228-2:2009 + A1:2014[24]. As a worst-case, it is assumed that percussive piling will be required during the construction of the new pylons and gantries. The predicted vibration levels are based on a piling rig with a hammer blow energy of 47.1kJ.

Table 14.28 – Predicted vibration levels for piles at refusal

Receptor	Distance from nearest pile to receptor, m	Predicted PPV for piles at refusal	Impact magnitude
HAR01	290	0.7	Low
HAR03	130	1.9	Medium
SEL16	20	22.1	High
SEL17	50	6.7	Medium
SEL19	160	1.5	Medium
YOR05	220	1.0	Low
River Ouse	60	5.3	Low*

*Although a medium impact would be predicted for a residential receptor, as the river assessment considers stability not annoyance a low magnitude is predicted.

Table 14.29 – Predicted vibration levels for piles not at refusal

Receptor	Distance from nearest pile to receptor, m	Predicted PPV for piles at refusal for scaling factors (K_p) (mms^{-1})			Impact magnitude
		Kp = 1	Kp = 2	Kp = 3	
HAR01	290	0.1	0.3	0.4	Negligible – Low
HAR03	130	0.4	0.8	1.2	Low – Medium
SEL16	20	4.4	8.8	13.2	Medium - High
SEL17	50	1.3	2.7	4.0	Medium
SEL19	160	0.3	0.6	0.9	Negligible – Low
YOR05	220	0.2	0.4	0.6	Negligible – Low
River Ouse	60	1.1	2.1	3.2	Negligible – Low*

*Although a medium impact would be predicted for a residential receptor, as the river assessment considers stability not annoyance a negligible to low magnitude is predicted

14.9.44 As the impact magnitudes for piles at refusal are higher than those not at refusal, the significance of effect will refer to the impact magnitude experienced for piles at refusal as a worst-case scenario. Residential receptors are of medium sensitive to noise (including vibration) effects. With reference to **Table 14.15**, it is considered that HAR01 and YOR05 result in effects of minor significance, which are **not significant**.

14.9.45 HAR03 and SEL19 experience medium impact magnitudes which equate to minor/moderate significance, which are potentially significant. Based on the likely duration of the piling, these effects would tend towards minor significance and therefore **not significant**.

14.9.46 Adverse vibration levels are only predicted at Monk Fryston Travellers' encampment (SEL16 and SEL17), if impact piling was to be used for foundations on pylon ID XC522. However, the geotechnical desk study has indicated likely suitable bearing-strata at a shallow depth at pylon ID XC522, similar to pylon ID XC523 where intrusive ground investigations have been carried out.

14.9.47 The consideration that the works near SEL16 and SEL17 do not give rise to significant effects due to vibration is based on review of ground conditions at a representative site nearby, and that the ground conditions at pylon ID XC424 are unlikely to be conducive to the use of impact piling. If these assumptions turn out to be incorrect following site-specific ground investigations, and impact piling is required, the vibration will be addressed using the Section 61 agreement process detailed in the NVMP (**Volume 5, Document 5.3.3H**).

14.9.48 Although construction vibration at River Ouse is predicted to lead to a maximum peak particle velocity of approximately 5 mms^{-1}, Should impact or vibratory piling techniques

be carried out in the construction of pylon ID XC421 then monitoring of the vibration will be carried out at the riverbank to ensure levels do not exceed 15 mms^{-1} and will be **not significant**.

14.9.49 Embedded mitigation measures to reduce the significant effects identified above are detailed in the **CoCP, Volume 5, Document 5.3.3B,** as secured through a DCO Requirement.

Assessment of operational noise

New operational 275kV/400kV overhead lines

14.9.50 For the assessment of overhead lines, the following conductor types have been assumed:

- 400kV twin conductor bundle L12 Twin Rubus (YN overhead line);
- 275kV single conductor bundle L8C Single Araucaria (SP overhead line); and
- 275kV twin conductor bundle L8C Twin Leipzig (XC overhead line).

14.9.51 Details of the assessment of the new operational overhead line are provided within **Appendix 14E, Volume 5, Document 5.3.14E**.

400kV (YN overhead line)

14.9.52 The sensitivity of the permanent NSRs is defined as **medium**. The Tier 1 screening distance is greater than 200 m from the YN line, Therefore Tier 2 screening is required. The Tier 2 screening distance is 52m from the YN line, with the closest receptor, YOR05, lying approximately 330m from the centreline, so the predicted effect is of negligible impact and therefore considered **not significant** for all permanent NSRs.

275kV (SP overhead line)

14.9.53 All permanent NSRs fall outside of the Tier 1 screening distance (172m from the 275kV SP line) with the closest receptor, YOR07, lying approximately 230m from the centreline. Furthermore, the Tier 2 screening distance is 0m from the centreline, so even considering Limits of Deviation, the predicted effect is of negligible impact and therefore considered **not significant** for all permanent NSRs.

275kV (XC overhead line)

14.9.54 All permanent NSRs fall outside of the Tier 1 screening distance (50m from the 275kV XC line) with the closest receptor, HAR03, lying approximately 130m from the centreline, so the predicted effect is of negligible impact and therefore considered **not significant** for all permanent NSRs.

14.9.55 The Travellers' encampment (represented by SEL16 and SEL17) is situated near to the Monk Fryston Substation. The Traveller encampment does not benefit from planning consent, however it is recognised that the encampment is located beneath (i.e. close to 0m from the centreline of) the existing overhead line and will be located under the proposed overhead line route. Whilst the receptors within the encampment are within the Tier 1 screening distance for vulnerable receptors (118m from the centreline), a Tier 2 assessment suggests that adverse impact would not arise from the proposed twin conductor arrangement (Tier 2 screening distance of 0m). The proposed XC line should result in lower electrical stress than the existing arrangement, therefore at these

receptors, this change in conductor and realignment is considered to be of **negligible magnitude** at the worst or a **minor beneficial change**, and as such the change is **not significant**.

Operational substation noise

14.9.56 The modelling has been undertaken on indicative locations of SGTs within the substation and are representative of the locations of the SGTs in the parameter plan to be submitted as part of the DCO application. The SGT final locations may change relative to the modelled locations due to micrositing during detailed design, but this will not significantly alter the emission levels at receptors or have any corresponding change on the BS4142 assessment or significance outcomes.

14.9.57 An assessment of the operational noise generated by the new substations has been conducted using the prediction methodology within ISO 9613-2:1996[27] and assessed in accordance with BS 4142:2014+A1:2019[26]. Broadband sound pressure levels have been provided for the proposed SGTs and cooling plant. The assessment is based on knowledge of similar equipment and refers to baseline sound level measurements around the identified substation areas.

14.9.58 A tonal penalty of +6dB has been applied to the unmitigated substation to account for low frequency 'hum' in the determination of rating levels. No other corrections have been applied (i.e. noise will not be impulsive, intermittent or contain other sound characteristics).

14.9.59 The four SGTs proposed at both the proposed Monk Fryston Substation and proposed Overton Substation, as described in paragraph 14.8.25 are expected to be the main sources of noise from the new substations under normal operation.

14.9.60 The National Grid Technical Specification TS 2.03[44] defines the guaranteed maximum sound power level (L_W) for SGTs for each specific substation site up to 950MVA. The assessment of operational sound generated by the substations has been conducted using the worst case sound power levels of the 1100MVA SGTs of 95 dB(A) under design load. The maximum sound power levels of the associated coolers are defined as 93 dB(A) under maximum load.

14.9.61 The proposed SGTs at the Monk Fryston and Overton Substations will require noise enclosures, as per the National Grid – Generic Electricity Design Manual TS 2.10.07 – April 2017. The enclosure must achieve an insertion loss of 20dB at 100Hz. This must include adjustments for internal reverberance build up, weaknesses in doors and access panels and transmission through openings (e.g. air vents) and protrusions (e.g. balancing fittings).

14.9.62 BS 4142:2014+A1:2019[26] states *'The standard is not applicable to the assessment of low frequency noise.'* However, the ANC technical guidance note on BS 4142:2014+A1:2019[49] states that *'BS 4142 does not necessarily exclude such a wide range* (10 – 160 Hz). *It would be reasonable to use BS 4142 down to 50 Hz and possibly lower as part of a tonality assessment, for example.'* The technical guidance note goes on to say that in connection to this:

- *'where low frequency sound clearly arises from the assessment site it could be considered as part of an assessment (see Annexes C and D of BS 4142);*

[49] Association of Noise Consultants (2020). BS 4142:2014 + A1:2019 Technical Note. (online). (Accessed 27 August 2021).

- *where low frequency noise is the dominant component of the specific sound source, the applicability of BS 4142 should be considered and justified if necessary; and*
- *care should be taken when identifying sources (at Section 4) that low frequency sources are correctly apportioned.*'

14.9.63 The issue of low frequency noise has been considered for noise modelling considerations, assessment of noise emission from the operational substations and in the design of mitigation.

Initial estimate of impact

14.9.64 Predicted operational noise levels have been compared with the lowest measured representative baseline sound levels (see **Appendix 14A**, **Volume 5, Document 5.3.14A** for more details) for those receptors closest to the Monk Fryston Substation in the BS 4142:2014+A1:2019[26] initial estimate of impact. All receptors considered are residential and of medium sensitivity. **Table 14.30** shows the results of the BS 4142:2014+A1:2019[26] initial estimate of impacts.

Table 14.30 – BS 4142:2014 + A1:2019[26] Assessment: initial estimate of impact: Monk Fryston Substation using night time background noise levels

ID	Predicted Specific Sound Level at Receiver, dB L_s	Representative Background Sound Level at Receiver (23:00 -07:00), dB L_{A90}, 15min	Character Penalty Correction, dB	Rating Level, dB $L_{Ar,Tr}$	Level Difference (i.e. Rating Level - Background), dB
SEL23	10	36	+6	16	-20
SEL15	8	41	+6	14	-27
SEL19	11	41	+6	17	-24
SEL18	9	41	+6	15	-26
SEL22	16	36	+6	22	-14

14.9.65 With reference to the impact magnitude criteria provided in **Table 14.21,** the results of the initial estimate of impact indicate that impacts of negligible magnitude are indicated at all receptors.

14.9.66 With reference to **Table 14.15**, the results of the initial estimate of impact during weekdays indicates effects are minor and are **not significant**.

14.9.67 Predicted operational noise levels have been compared with the lowest measured representative baseline sound levels (see **Appendix 14A, Volume 5, Document 5.3.14A**) for more details) for those receptors closest to the Overton Substation in the BS 4142:2014+A1:2019[26] initial estimate of impact. All receptors considered are residential and of medium sensitivity. **Table 14.31** shows the results of the BS 4142:2014+A1:2019[26] initial estimate of impacts.

Table 14.31 – BS 4142:2014+A1:2019[26] Assessment: initial estimate of impact: Overton Substation

ID	Predicted Specific Sound Level at Receiver, dB L_s	Representative Background Sound Level at Receiver, dB $L_{A90,\ 15min}$	Character Penalty Correction, dB	Rating Level, dB $L_{Ar,Tr}$	Level Difference (i.e. Rating Level - Background), dB
YOR06	9	28	+6	15	-13
HAM08	10	26	+6	16	-10
HAM10	8	39	+6	14	-25
HAM07	8	25	+6	14	-11
HAM09	10	26	+6	16	-10

14.9.68 With reference to the impact magnitude criteria provided in **Table 14.21**, and significance of effect criteria in **Table 14.15**, the predicted results in **Table 14.31** indicate that impacts are of negligible adverse effect and low adverse effect respectively and are therefore **not significant**. The following section discusses the contextual implications of the proposed operational noise of the substations.

Consideration of context

14.9.69 Consideration of the contextual aspects is provided below, in accordance with BS 4142:2014 + A1:2019[26], and is followed by determination of significance of potential impacts.

14.9.70 By comparing the predicted specific levels of the operational substation noise (mitigated), and the measured ambient sound levels, the contextual difference in noise levels at the receptors and maginitude of impact can be determined.

14.9.71 Grid noise maps showing the calculated propagation of noise from the proposed Monk Fryston Substation is shown in **Figure 14.2** and **Figure 14.3, Volume 5, Document 5.4.14**.

Table 14.32 – BS 4142:2014+A1:2019[26] Noise Change Assessment: Monk Fryston Substation

ID	Predicted Site Rating Level at Receiver, dB $L_{Ar,Tr}$	Representative Night-Time Ambient Sound Level at Receiver, dB $L_{Aeq,15min}$	Total Night-Time Sound Level at Receiver, with Development dB $L_{Aeq,15min}$	Level Difference (i.e. Level with Development minus Ambient), dB
SEL23	16	49	49	+0
SEL15	14	48	48	+0
SEL19	17	52	52	+0
SEL18	15	63	63	+0
SEL22	22	49	49	+0

14.9.72 **Table 14.32** shows that at all receptors around the proposed Monk Fryston Substation no change in ambient sound levels is predicted due to noise from the operation of the substation. Impacts of negligible magnitude are indicated at all receptors.

Table 14.33 – BS 4142:2014 + A1:2019[26] noise Change assessment: Overton Substation

ID	Predicted Site Rating Level at Receiver, dB L_s	Representative Night Time Ambient Sound Level at Receiver, dB $L_{Aeq,15min}$	Sound Level at Receiver, with development dB $L_{Aeq,15min}$	Level Difference (i.e. Level with development - Ambient), dB
YOR06	15	52	52	+0
HAM08	16	54	54	+0
HAM10	14	45	45	+0
HAM07	14	51	51	+0
HAM09	15	52	52	+0

14.9.73 **Table 14.33** shows that at all receptors around the proposed Overton Substation are predicted to experience no change in ambient sound levels is predicted due to noise from operational noise of the substation.

14.9.74 The calculated propagation of noise from the proposed Overton Substation is shown in **Figure 14.4** and **Figure 14.5, Volume 5, Document 5.4.14**.

14.9.75 Sound levels at all receptors assessed in **Table 14.30** and **Table 14.31** are predicted to be below the background. **Table 14.32** and **Table 14.33** show that no changes in ambient noise level are predicted. The operational noise of the substations are therefore considered a low impact, and adverse impacts are unlikely to occur and therefore **not significant**.

14.9.76 Based on the above, it is considered that the initial estimate of impact is correct. As such, the results of the assessment indicate that, adverse impacts are not likely and therefore **not significant**.

14.10 Assessment of cumulative effects

Inter-project (combined with other development) cumulative effects

14.10.1 An assessment of the effects which could result from the Project in cumulation with other developments in the vicinity of the Project is provided in **Chapter 18: Cumulative Effects Assessment (Volume 5, Document 5.2.18).**

Intra-project (within the Project) cumulative effects

14.10.2 Intra-related effects have been considered in this assessment, i.e. where effects in one environmental area could give rise to effects in others. The greatest potential for noise and vibration effects that are inter-related with other aspects is considered to be with biodiversity (**Chapter 8, Volume 5, Document 5.2.8**), air quality (**Chapter 13, Volume 5, Document 5.2.13**), landscape and visual (**Chapter 6, Volume 5, Document 5.2.6**), traffic (**Chapter 12, Volume 5, Document 5.2.12**), socio-economics (**Chapter 16, Volume 5, Document 5.2.16**) and health (**Chapter 15, Volume 5, Document 5.2.15**).

14.10.3 There are potential inter-related effects relating to noise and vibration, as follows:

- noise effects and vibration effects at highly sensitive receptors (SEL16 and SEL17). When taken in isolation, the noise is not considered significant, but in accumulation with the vibration impacts, a significant cumulative effect is expected if impact piling is used for the pylon adjacent to these receptors.
- noise effects on biodiversity receptors, including protected species. This is discussed in **Chapter 8, Volume 5, Document 5.2.8**. No significant effects have been identified in relation to ecological receptors and noise and vibration.
- noise effects on residential receptors which are also affected by a combination of air quality, visual, traffic, socio-economic and health effects which are discussed in **Chapters 6, 8, 12, 13, 15 and 16 (Volume 5, Documents 5.2.6, 5.2.8, 5.2.12, 5.2.13, 5.2.15 and 5.2.16)** and conclusion on the receptors potentially affected by these effects in **Chapter 18, Volume 5, Document 5.2.18**. It should be noted that the conclusions on significant effects in the socio-economic and health assessment draw upon the results of the noise, air quality, traffic and visual assessments.

14.11 Significance conclusions

A summary of the results of the noise and vibration assessment is provided in **Table 14.34**.

Table 14.34 – Summary of significance of effects

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
Construction				
Section A: Osbaldwick Substation				
Construction noise between Monday – Friday 07:00 – 19:00 and Saturday 07:00 – 13:00; Monday – Friday 19:00 – 23:00, Saturday 13:00 – 23:00 and Sunday 07:00 – 23:00; and Monday – Sunday 23:00 – 07:00				
YOR09 – YOR12	Medium	Low	Not significant	Works are not predicted to exceed the threshold and therefore effects are not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Section B: North West of York Area				
Construction noise between Monday – Friday 07:00 – 19:00 and Saturday 07:00 – 13:00; Monday – Friday 19:00 – 23:00, Saturday 13:00 – 23:00 and Sunday 07:00 – 23:00				
HAM01 – 11, HAR01 – HAR03, YOR01 – YOR08	Medium	Low	Not significant	Works are not predicted to exceed the threshold and therefore effects are not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
Construction noise between Monday – Sunday 23:00 – 07:00				
HAM03, HAM04, HAM08, HAM11, YOR06	Medium	Low	Not significant	Whilst an exceedance of the night-time threshold is predicted, not all activities modelled will overlap and therefore the threshold will not be reached and the effects are predicted to be not significant.
HAM05 and YOR03 during works closest to pylon ID YN001	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID YN001 are predicted to exceed the threshold at HAM05, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
HAM05 and YOR03 outside of works closest to pylon ID YN001	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
HAR01 during works closest to pylon ID XC429	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID XC429 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
HAR01 outside of works closest to pylon ID XC429	Medium	Low	Not significant	Works are not predicted to exceed the threshold and therefore the effects are not significant.
HAR03 during works closest to pylon ID XC425	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID XC425 are predicted to exceed the threshold, however due to the activity duration being lower

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
				than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
HAR03 outside of works closest to pylon ID XC425	Medium	Low	Not significant	Works are not predicted to exceed the threshold and therefore the effects are not significant.
YOR04 and YOR05 during works closest to pylon ID YN004	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID YN004 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
YOR04 and YOR 05 outside of works closest to pylon ID YN004	Medium	Low	Not significant	Works are not predicted to exceed the threshold and therefore the effects are not significant.
YOR07 during works closest to pylon IDs SP006 and SP007	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon IDs SP006 and SP007 are predicted to exceed the threshold and are therefore significant, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
YOR07 outside of works closest to pylon IDs SP006 and SP007	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
YOR08 during works closest to pylon ID XC422	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID XC422 are predicted to exceed the threshold, however due to the activity duration being lower

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
				than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
YOR08 outside of works closest to pylon ID XC422	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
HAM01 – 02, HAM06 – 07, HAM09 – 10, HAR02, YOR01 - 02	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Section C: Moor Monkton to Tadcaster				
Construction noise between Monday – Friday 07:00 – 19:00 and Saturday 07:00 – 13:00				
HAR04 – 08, SEL01 – 03	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Construction noise between Monday – Friday 19:00 – 23:00, Saturday 13:00 – 23:00 and Sunday 07:00 – 23:00				
HAR06 during works on pylon ID XC446	Medium	Low	Not significant	Stringing works on pylon ID XC446 are predicted to exceed the threshold, however due to the activity

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
				duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
HAR06 outside of works on pylon ID XC446	Medium	Negligible	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
HAR04 – 05, HAR07 – 08, SEL01 – 03	Medium	Negligible	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Construction noise between Monday – Sunday 23:00 – 07:00				
HAR04 - 05 during works closest to pylon ID XC435	Medium	High	Not significant	Pulling bonds over scaffolding works closest to pylon ID XC435 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
HAR04 – 05 outside of works closest to pylon ID XC435	Medium	Low	Not significant	Works are not predicted to exceed the threshold and therefore the effects are not significant.
HAR08 during works closest to pylon ID XC451	Medium	High	Not significant	Pulling bonds over scaffolding works closest to pylon ID XC451 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
				paragraph 14.9.17, the effects are predicted to be not significant.
HAR08 outside of works closest to pylon ID XC451	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
SEL01 during works closest to pylon ID XC473	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID XC473 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
SEL01 outside of works closest to pylon ID XC473	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
HAR06 – 07, SEL02 – 03	Medium	Negligible	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Section D: Tadcaster Area				
Construction noise between Monday – Friday 07:00 – 19:00 and Saturday 07:00 – 13:00				
SEL04 – 10	Medium	Low	Not significant	Works are not predicted to exceed the threshold and therefore the result is not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
Construction noise between Monday – Friday 19:00 – 23:00, Saturday 13:00 – 23:00 and Sunday 07:00 – 23:00				
SEL09 during HDD works	Medium	High	Not significant	Threshold criteria are predicted to be exceeded whilst HDD works take place in Tadcaster, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
SEL09 during works on pylon ID XC481	Medium	High	Not significant	Threshold criteria are predicted to be exceeded whilst stringing works on pylon ID XC481 are undertaken, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
SEL09 outside of HDD works and works on pylon ID XC481	Medium	Low	Not significant	Works to establish and install foundations at the main Tadcaster Tee East CSE compound are predicted to exceed threshold values, however with the installation of required barriers the predictions drop to below threshold values and the residual effect is therefore not significant.
SEL04 – 08, SEL10	Medium	Low	Not significant	Works are not predicted to exceed the threshold and therefore the result is not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Construction noise between Monday – Sunday 23:00 – 07:00				

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
SEL05, SEL08, SEL09 and SEL10 during HDD works	Medium	High	Not significant	HDD works are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
SEL05, SEL08, SEL09 and SEL10 outside of HDD works	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
SEL04, SEL06 - 07	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Section E: Tadcaster to Monk Fryston				
Construction noise between Monday – Friday 07:00 – 19:00 and Saturday 07:00 – 13:00				
SEL16 and SEL17 during works on pylon ID XC522	High	High	Not significant	Given the short duration of the works due to give rise to a high magnitude of change, the effect has been reduced to not significant. However, noise from these works at the vulnerable NSR will be controlled to BPM through the application of the CoCP.
SEL16 and SEL17 outside of works on pylon ID XC522	Medium	Low	Not significant	When works are not conducted on pylon ID XC522, the threshold is not predicted to be exceeded and therefore the result is not significant.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
SEL11 – 14	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Construction noise between Monday – Friday 19:00 – 23:00, Saturday 13:00 – 23:00 and Sunday 07:00 – 23:00				
SEL16 and SEL17 during works on pylon ID XC522	High	High	Not significant	Given the short duration of the works due to give rise to a high magnitude of change, the effect has been reduced to not significant. However, noise from these works at the vulnerable NSR will be controlled to BPM through the application of the CoCP.
SEL16 and SEL17 outside of works on pylon ID XC522	Medium	Low	Not significant	When works are not conducted on pylon ID XC522, the threshold is not predicted to be exceeded and therefore the result is not significant.
SEL11 – 14	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
Construction noise between Monday – Sunday 23:00 – 07:00				
SEL11 during works closest to pylon ID XC486	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID XC486 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
SEL11 outside of works closest to pylon ID XC486	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
SEL12 during works closest to pylon ID XC494	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID XC494 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
SEL12 outside of works closest to pylon ID XC494	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
SEL13 during works closest to pylon ID XC505	Medium	High	Not significant	Pulling bonds over scaffold works closest to pylon ID XC505 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
SEL13 outside of works closest to pylon ID XC505	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
SEL16 and SEL 17 during works closest to pylon IDs XC521 and XC523	High	High	Not significant	Pulling bonds over scaffold works closest to pylon IDs XC521 and XC522 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant. However, noise from these works at the vulnerable NSR will be controlled to BPM through the application of the CoCP.
SEL16 and SEL17 outside of works closest to pylon IDs XC521 and XC523	High	Low	Not significant	Works are not predicted to exceed the threshold and will be managed through the CoCP. The effects are therefore not significant.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
				However, noise from these works at the vulnerable NSR will be controlled to BPM through the application of the CoCP.
SEL14	Medium	Low	Not significant	Works are not predicted to exceed the threshold and will be managed through the CoCP. The effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Section F: Monk Fryston Substation Area				
Construction noise between Monday – Friday 07:00 – 19:00 and Saturday 07:00 – 13:00				
SEL15, SEL18 – 23	Medium	Low	Not significant	Works are not predicted to exceed the threshold and will be managed through the CoCP. The effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Construction noise between Monday – Friday 19:00 – 23:00, Saturday 13:00 – 23:00 and Sunday 07:00 – 23:00				
SEL19 during works on pylon ID XC524	Medium	Low	Not significant	Works on pylon ID XC524 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
SEL19 outside of works on pylon ID XC524	Medium	Low	Not significant	Works are not predicted to exceed the threshold and the effects are therefore not significant.
SEL15, SEL18, SEL20 – 23	Medium	Low	Not significant	Works are not predicted to exceed the threshold and will be managed through the CoCP. The effects are therefore not significant.
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Construction noise between Monday – Sunday 23:00 – 07:00				
SEL19 during works closest to pylon ID XC523	Medium	Medium	Not significant	Pulling bonds over scaffold works closest to pylon ID XC523 are predicted to exceed the threshold, however due to the activity duration being lower than the temporal criteria explained in paragraph 14.9.17, the effects are predicted to be not significant.
SEL19 outside of works closest to pylon ID XC523	Medium	Low	Not significant	Works are not predicted to exceed the threshold and will be managed through the CoCP. The effects are therefore not significant.
SEL15, SEL18, SEL20 – 23	Medium	Low	Not significant	Works are not predicted to exceed the threshold and will be managed through the CoCP. The effects are therefore not significant.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
NSRs within 50m from the kerb of construction traffic routes	Medium	Negligible	Not significant	The predicted traffic increase is not predicted to give significant rise to noise levels.
Construction Vibration				
Construction vibration: HAR03	Medium	Medium	Not significant	Based on the likely duration of the piling, the effects would tend towards minor significance and therefore not significant.
Construction vibration: HAR01, YOR05	Medium	Low	Not significant	As the piles at refusal are predicted to result in effects of minor significance, this is considered not significant.
Construction vibration: SEL16	High	Negligible	Not significant	Impact piling unlikely to be undertaken in this location.
Construction vibration at SEL17	High	Negligible	Not significant	Impact piling unlikely to be undertaken in this location.
Construction vibration at SEL19	Medium	Medium	Not significant	Based on the likely duration of the piling, the effects would tend towards minor significance and therefore not significant.
Operation				
Residential receptors in North West of York (Section B), Tadcaster (Section D) and Monk Fryston –	Medium	Low	Not significant	All receptors are at a distance from the overhead line sufficient that threshold for adverse impact is not met, therefore not significant.

Receptor and Summary of Predicted Effects	Sensitivity/ importance/ value of receptor NOTE1	Magnitude of Change NOTE2	Significance NOTE3	Summary Rationale
Operation of proposed or realigned overhead line				
Residential receptors in North West of York (Section B) – Operation of Overton Substation	Medium	Low	Not significant	Noise levels are predicted to be below background levels and therefore impacts are not significant. No change in ambient noise levels are predicted due to the operation of the new substation, therefore impacts are not significant.
Residential Receptors in Monk Fryston (Section F) – Operation of Monk Fryston Substation	Medium	Low	Not significant	Noise levels are predicted to be below background levels and therefore impacts are not significant. No change in ambient noise levels are predicted due to the operation of the new substation, therefore impacts are not significant.

NOTE1. The sensitivity/importance/value of a receptor is defined using the criteria set out in **Section 14.8** and is defined as low, medium or high.

NOTE2. The magnitude of change experienced by a receptor resulting from activities relating to the development is defined using the criteria set out in **Section 14.8** and is defined as negligible, low, medium or high.

NOTE3. The significance of the environmental effect is based on the combination of the sensitivity/importance/value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in **Section 14.8**.

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