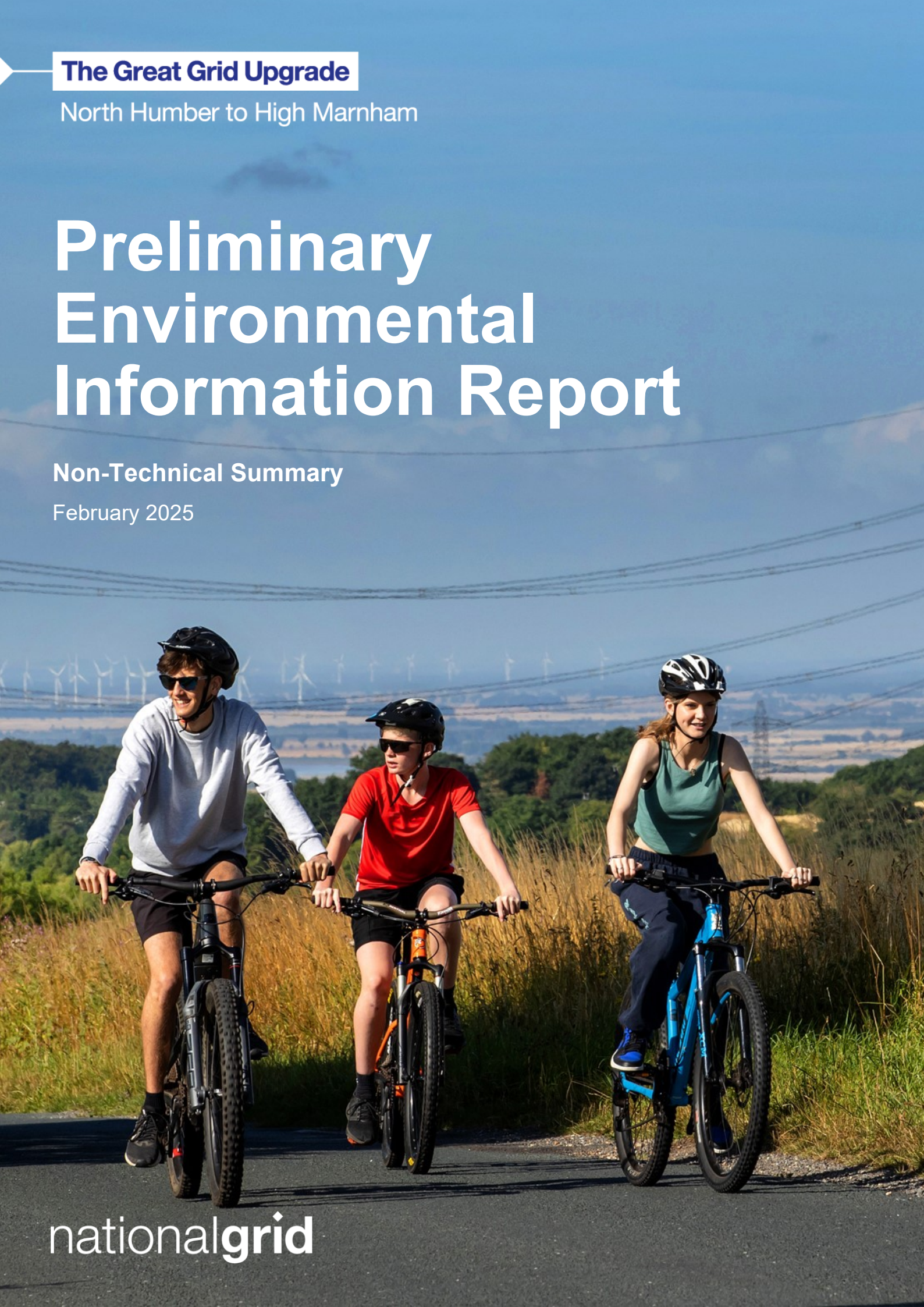
The Great Grid Upgrade

North Humber to High Marnham

Preliminary Environmental Information Report

Non-Technical Summary

February 2025



nationalgrid

Contents

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1. Introduction

1.1 Overview

1.1.1 North Humber to High Marnham (referred to as the Project) is a development proposed by National Grid Electricity Transmission plc (referred to as National Grid) to reinforce the high-voltage electricity power line network between a new Birkhill Wood Substation, close to the existing Creyke Beck Substation in Yorkshire, and a new substation adjacent to the existing High Marham Substation in Nottinghamshire. It comprises of approximately 90 km of new electricity infrastructure, comprising of new overhead power lines, two new substations, works to existing pylons and diversions of existing third party assets.

1.1.2 Due to its size, the Project is defined as a "Nationally Significant Infrastructure Project". The Planning Act 2008 requires National Grid to make an application to the Secretary of State, for development consent to build and operate the Project. Development consent is granted through a Development Consent Order (DCO).

1.1.3 A Preliminary Environmental Impact Report (PEIR) has been prepared as part of the pre-application consultation. It sets out the preliminary environmental information and the preliminary findings of the Environmental Impact Assessment (EIA) undertaken to date. Once completed, the findings of the EIA will be presented in a document called an Environmental Statement, which will be one of several documents submitted within the DCO application.

1.1.4 Investigations into the Project's effects and the possible measures to reduce these effects are being carried out as part of a process called Environmental Impact Assessment. The purpose of the PEIR is to allow members of the public, consultation bodies, and other stakeholders, to understand what the preliminary likely significant effects of the Project are likely to be, and comment on areas of interest (see section 6 on how to provide feedback). Feedback received through the consultation process will be used by National Grid to inform the ongoing development of the Project design and identify additional measures to address likely significant environmental effects. The final assessment will be presented within the Environmental Statement (ES) submitted with the application for development consent. This will take into account the representations made during the statutory consultation and ongoing design informed by the EIA process.

1.1.5 This Non-Technical Summary (NTS) presents a summary of the information contained in the PEIR for the Project.

1.2 Purpose of this Non-Technical Summary

1.2.1 The NTS has been prepared to enable local communities and other stakeholders understand the likely preliminary environmental effects arising from the Project, as reported in the PEIR, in a concise manner.

1.2.2 This NTS includes an outline of the main alternatives considered, description of the Project, the methodology and approach to the PEIR, the preliminary environmental assessment undertaken to date and next steps. Table 1.1 sets out further details of each of the sections of this NTS.

Table 1.1 – What's included in this NTS

Section	What is it about?
1: Introduction	This section introduces National Grid, what the proposed Project is, where it is located and why it is needed.
2: Main Alternatives Considered	This section explains the main alternative designs considered to date and provides a summary of how the design has evolved and developed to date.
3: Project Description	This section explains how the Project would be built (should it be consented), what new electricity infrastructure would be implemented and how long construction would take.
4: Approach and Methodology	This section explains how the preliminary assessment has been undertaken and how it has been informed by consultation and stakeholder engagement to date.
5: Preliminary Environmental Assessment	This section provides a summary of the potential environmental effects arising from the Project which have been identified to date.
6: Looking Forward	This section details the next steps of the pre-application process and how you can provide feedback to National Grid on the statutory consultation material.

1.2.3 The PEIR has been prepared at a point in time during the EIA process when the design of the Project is still being refined, the likely significant environmental effects are still being assessed and the potential for mitigation measures is being fed back into the design of the Project.

1.2.4 The full findings of the EIA process will be presented in an Environmental Statement which will be submitted with the application for development consent.

1.3 What is North Humber to High Marnham

1.3.1 North Humber to High Marnham is a development to reinforce the high-voltage electricity power line network between a new Birkhill Wood Substation, close to the existing Creyke Beck Substation in Yorkshire, and a new substation adjacent to the existing High Marham Substation in Nottinghamshire. It comprises of approximately 90 km of new electricity infrastructure, comprising of new overhead power lines, two new substations, works to existing pylons and diversions of existing third party assets. These are shown on the Figures, Non-Technical Summary Plans.

1.4 Who is National Grid

1.4.1 National Grid owns, builds and maintains the electricity transmission network in England and Wales. Under the Electricity Act 1989, National Grid holds a transmission licence under which it is required to develop and maintain an efficient, coordinated, and economic electricity transmission system.

1.5 Why is North Humber to High Marnham needed?

1.5.1 National Grid is working to build a cleaner, fairer, and more affordable energy system that serves everyone, powering the future of our homes, transport, and industry. The Project would support the UK's net zero target through the connection across Yorkshire, Lincolnshire and Nottinghamshire of new low carbon energy generation by building a new electricity power line and by reinforcing the local transmission network. The Project is part of The Great Grid Upgrade - the largest overhaul of the electricity transmission grid in generations.

1.5.2 The Project is necessary to support the connection of new power generation projects in Scotland and the northeast of England in the next ten years and beyond. National Grid identified that the existing network of electricity power lines, even with the current upgrading works, is not sufficient to meet connection of power generation demand and electricity transmission going forward.

1.5.3 Without reinforcing and adding additional capacity to the electricity power line network, electricity which comes from offshore wind and interconnectors (which are high voltage cables that connect the transmission system in the UK with the transmission systems in other countries) will be limited, making the network less efficient and may require using more polluting energy sources, slowing down progress towards net zero.

1.5.4 Reinforcing and adding additional capacity to the electricity power line network would provide greater security in the region and reduce the risk of outages (a period of interruption to electricity supply) from limited electricity availability. If the network is not reinforced, outages could result in a greater risk of widespread electricity supply interruptions.

1.5.5 With growing offshore wind and interconnectors, an anticipated tripling of wind generation connected across the Scottish networks by 2030 and Government's increased ambition to connect 50 (gigawatts) GW of offshore wind by 2030, north-south power flows are set to increase.

1.5.6 The existing electricity transmission network in the Humber and East Midlands region was initially developed in the 1960s and has historically been able to meet demand. However, due to the changes noted above in terms of delivering net zero emissions, the existing network in the Humber and East Midlands region does not have the capability to reliably and securely transport all the energy that will be connected by 2030, whilst operating to the standards it is required to.

1.5.7 The Project will support the UK's net zero target by reinforcing the electricity transmission network between the north of England and the Midlands and facilitate the connection of planned offshore wind generation and interconnectors with other countries, allowing clean green energy to be carried on the network. The Project, together with other reinforcements along the East Coast, will help meet future energy requirements.

1.6 The Consenting Process for the Project

1.6.1 The Project is classified as a Nationally Significant Infrastructure Project (NSIP) and National Grid need to obtain development consent for the Project from the Government. NSIPs are projects of certain types, over a certain size, which are considered by the Government to be of national importance, hence permission to build them needs to be given at a national level, by the relevant Secretary of State (in this case the Secretary of State for Energy Security and Net Zero). Therefore, for the Project National Grid must apply to the Secretary of State for a DCO.

1.6.2 The DCO application will be submitted by National Grid to the Planning Inspectorate. The Planning Inspectorate is the government body responsible for operating the planning process for NSIPs. It will first decide whether to accept the DCO application for Examination, and if accepted, will appoint an independent Inspector or panel of Inspectors (known as the Examining Authority) to examine the DCO application on behalf of the Secretary of State. The Examination is a public process in which interested parties are able to participate.

1.6.3 Following Examination, the Examining Authority will make a recommendation to the Secretary of State, who will then decide whether development consent should be granted. The timescale between acceptance of the application and a decision is approximately 18 months.

1.6.4 National Grid expects to submit its DCO application for the Project to the Planning Inspectorate in Summer 2026.

1.7 Environmental Impact Assessment

1.7.1 The Project is classified as an Environmental Impact Assessment development under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. National Grid is therefore required to complete an EIA.

1.7.2 The EIA process is reported within three key documents:

- EIA Scoping Report: This defines the scope of the EIA and the matters to be assessed.

- Preliminary Environmental Information Report: Prepared to provide preliminary details of the environmental work and anticipated likely significant effects across a range of topics as result of the Project. The PEIR is published alongside statutory consultation.
- Environmental Statement: This details the anticipated environmental effects of the Project and any mitigation measures, and forms part of the submitted DCO application.

1.7.3 In Summer 2023, National Grid requested the formal opinion (a “Scoping Opinion”) of the Planning Inspectorate on the form and nature of the EIA to be undertaken. This request was accompanied by the EIA Scoping Report. The Planning Inspectorate provided its feedback within a Scoping Opinion, detailing what should be included and considered within the EIA.

1.7.4 The PEIR has been prepared for pre-application consultation to set out the preliminary environmental information and the preliminary findings of the EIA undertaken to date. The PEIR allows consultees to develop an informed view of the likely significant environmental effects of the Project and provide any comments on the preliminary findings as part of National Grid’s statutory consultation on the Project. These comments will help inform the ongoing development of the Project and the EIA process before an application is made to the Secretary of State.

1.7.5 Following statutory consultation, the Environmental Statement will be prepared which will be submitted with the application for a DCO.

2. Main Alternatives Considered

2.1 Introduction

2.1.1 National Grid undertakes options appraisals during the first stage of development for all its new projects. These often identify a number of different approaches a project could take to achieve its purpose – this is known as the 'Needs Case' and may include consideration of different locations, technologies or designs.

2.1.2 Options appraisal is a robust and transparent process that is used to compare options and to assess the positive and negative effects. Option appraisals are undertaken to compare and assess how each option performs using criteria including environmental, socio-economics, technical and cost factors, as set out in National Grid's Our Approach to Options Appraisal. The aim is to find a balanced outcome, bearing in mind National Grid's statutory duties. The appraisal process is documented to provide, in a transparent manner, information upon which decisions are based.

2.1.3 Image 2.1 shows where the options appraisal sits within National Grid's approach to project development and delivery[1].

Image 2.1 - National Grid's Approach to Project Development and Delivery

2.2 Strategic Proposal and Options Identification

2.2.1 Following the needs case being identified, National Grid started their optioneering process to determine how best to achieve the objectives of reinforcing the flow of power from the north to the south of England. The objective of the first stage in the options appraisal process is to determine a preferred strategic option or Strategic Proposal.

2.2.2 A total of five strategic options that might address network needs were identified. These options included a range of different technologies and multiple connection points, including offshore and onshore connections.

[1] 43037-Approach to Options Appraisal.pdf

2.2.3 The strategic options that might address network needs were appraised at a strategic level, which included consideration of the likely environmental and socio-economic effects, technical issues, and costs associated with each strategic option. A total of five strategic options were identified and appraised against these factors, comprising:

- ECO 1: New Creyke Beck to new High Marnham (85 km).
- ECO 2: New Creyke Beck to Cottam (75 km).
- ECO 3: New Creyke Beck to new Grimsby West, new Grimsby West to new Walpole (225 km).
- ECO 4: New Creyke Beck to new Grimsby West, new Grimsby West to new Weston Marsh (200 km).
- ECSS 1: Subsea from new Creyke Beck - new Walpole (195 km).

2.2.4 Options were discounted owing to a number of factors including the presence of complex environmental features such as the Lincolnshire Wolds Area of Outstanding Natural Beauty (AONB), and sites including Special Areas of Conservation, Special Protected Areas and Sites of Special Scientific Interest designated for their ecological importance. Other considerations included the potential for infrastructure to oversail properties and being positioned near settlement boundaries, and options having higher capital costs for limited benefit.

2.2.5 Following the appraisal process, ECO 1 was selected as the preferred strategic option as it represented the most advantageous option when balancing cost, technical performance, and environmental and socio-economic effects.

2.2.6 The preferred strategic option comprised of:

- A new or upgraded substation in the Creyke Beck / Birkhill Wood area north of the city of Hull;
- The construction of a new reinforcement electricity power line from the new or upgraded substation; and
- A new or upgraded substation located in the area of High Marnham.

2.2.7 This preferred strategic option formed the basis of the Project which has been designed in outline and developed. Further information on the strategic options considered can be found in the North Humber to High Marnham and Grimsby to Walpole - Updated Strategic Options Report (2025) which can be found on the Project Website[2].

2.3 Options Identification and Selection

2.3.1 Following the selection of ECO 1, National Grid undertook a study to further define the location of the Project infrastructure.

2.3.2 This process involved the identification of a broad study area based on the start and end points of the Project, within which preliminary corridor options to accommodate infrastructure were identified.

[2] https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/north-humber-to-high-marnham/document-library

2.3.3 Options were established by environmental professionals, giving regard to constraints identified within the study area, for example designated sites. Using computer software, a series of corridors with the least potential to conflict or interact with these constraints were identified, mapped and reviewed by National Grid. Site surveys were also undertaken to help refine these corridors, prior to them being appraised.

2.3.4 A total of four corridor options within the study area were identified and subsequently divided into sections for appraisal[3]. A stepped approach was applied in the appraisal as it was recognised that each corridor contained localised constraints which could be avoided by linking different sections of corridors together to form a single preferred corridor.

2.3.5 A key consideration informing option development and selection was that routeing the new overhead line close to the existing 400 kV network would minimise the overall environmental impacts of the Project by focusing these in areas already impacted by infrastructure (rather than spreading them more widely).

2.3.6 From this appraisal an emerging preferred corridor was established for the Project. This corridor was consulted on as part of the non-statutory consultation in 2023, and the feedback and local knowledge gathered from this consultation was used by National Grid to help further develop the Project.

2.3.7 Following this, a potential alternative corridor was identified for the part of the route between South Wheatley and High Marnham to the south of the route, as a result of review of previous work to date and in response to consultation feedback requesting to move the emerging preferred corridor further east away from villages and closer to existing overhead lines. This alternative corridor, referred to as the 'eastern corridor', was proposed as an alternative to that part of the route within the emerging preferred corridor consulted on in 2023. The part of the emerging preferred corridor between South Wheatley to High Marnham is subsequently referred to as the 'western corridor' for ease of reference and comparison with the eastern corridor.

2.3.8 The eastern corridor was appraised against the same factors used in the earlier corridor appraisal work and was subjected to a localised non-statutory consultation in 2024.

2.3.9 Feedback from both the non-statutory consultation in 2023 and the localised non-statutory consultation in 2024, ongoing technical assessments and surveys have been used to identify which option was preferred for the Project. National Grid concluded that the western corridor was the preferred solution between South Wheatley and High Marnham for the end-to-end preferred corridor.

2.3.10 The end-to-end preferred corridor accordingly forms the extents within which the preferred alignment for the Project is located, upon which the preliminary assessments have been undertaken.

[3] https://www.nationalgrid.com/electricity-transmission/document/148821/download

Substations

2.3.11 The Project would need to connect to two new substations one would be located at Creyke Beck, Cottingham, (known as Birkhill Wood Substation) in the East Riding of Yorkshire and the second would be located at High Marnham in Nottinghamshire. These two substations form part of the Project to be consulted upon at Statutory Consultation and are detailed further within **Chapter 4 Description of the Project** of the PEIR.

2.3.12 To identify the most suitable locations of these two substations the following methodology for identifying and appraising potential siting options for the substations and the identification of the preferred option has followed a staged process involving:

- The identification of the study area for the new substation based a range of technical requirements for each substation, such as existing and future customer connections and proximity to power infrastructure;
- Analysis of technical, environmental and socio-economic constraints, features and opportunities within the study area and identification and refinement of a long list of potential site options; and
- Appraisal of shortlisted substation site options and identification of the preferred site.

Birkhill Wood Substation

2.3.13 Within the study area, seven potential sites were identified through mapping potential environmental and land use factors that could constrain siting. Of these, three sites were shortlisted and were taken forward to strategic options appraisal stage, which further considered the environmental, socio-economic, technical and cost implications of each option. Upon completing this process, a preferred site was selected as the preferred option for inclusion within the Project.

High Marnham Substation

2.3.14 Within the study area, 19 potential sites were identified through the same process of mapping potential environmental and land use factors that could constrain siting. Of these, four site were shortlisted and taken forward to strategic options appraisal stage. Following the completion of the process, a preferred site was selected as the preferred option for inclusion within the Project.

2.3.15 The draft Order Limits for the two preferred substations options are shown within Figures, Non-Technical Summary Plans.

3. Project Description

3.1 Key Components of the Project

3.1.1 The current design of the Project includes the following elements:

- Approximately 90 km of new overhead power line between the new Birkhill Wood and High Marnham 400 kV Substations.
- Replacement and re-alignment of a section of the existing 400 kV 4ZQ overhead power line route between Brantingham and east of Broomfleet.
- Replacement and re-alignment of a section of the existing 400 kV ZDA overhead power line route between Ealand and west of Keadby.
- A new 400 kV Birkhill Wood substation, with a new permanent access. This is proposed to be a Gas Insulated Switchgear (GIS) substation.
- Replacement and re-alignment of a section of the existing 400 kV 4ZR route to allow for connection into the new Birkhill Wood substation.
- A new 400 kV High Marnham substation, with a new permanent access. This is proposed to be an Air Insulated Switchgear (AIS) substation.
- Replacement and re-alignment of the existing 4ZV and XE 275 kV overhead power line routes and existing 400 kV ZDA and ZDF overhead power line routes, to allow for connection into the new High Marnham substation.

3.1.2 The Project would include other required works, for example temporary diversions for works on existing overhead power lines, temporary access roads, highway works, temporary works compounds, work sites and ancillary works. The Project would also require utility diversions and drainage works. Land required to deliver environmental mitigation, compensation and enhancement, including biodiversity net gain.

3.1.3 The new Birkhill Wood and High Marnham substations are proposed to be consented by separate local authority planning applications which are proposed to be submitted in 2025. Whilst the implementation of these two substations remains subject to achieving consent through these separate planning applications, in order to achieve a comprehensive consenting position for the Project these substations and their associated overhead line reconfigurations have also been included as part of the Project and are referred to as the Proposed Substation Works

3.1.4 **Chapter 4 Description of the Project**, PEIR provides a detailed description of the Project both in terms of construction and operation and necessary and known maintenance activities.

3.1.5 The Project has been divided into eleven Route Sections; these are shown on Environmental Constraints Plans and comprise:

- Route Section 1: Creyke Beck to Skidby;
- Route Section 2: Skidby to A63 Dual Carriageway;
- Route Section 3: A63 Dual Carriageway to River Ouse Crossing;

- Route Section 4: River Ouse Crossing;
- Route Section 5: River Ouse Crossing to Luddington;
- Route Section 6: Luddington to M180 Motorway;
- Route Section 7: M180 Motorway to Graizelound;
- Route Section 8: Graizelound to Chesterfield Canal;
- Route Section 9: Chesterfield Canal to A620 east of North Wheatley;
- Route Section 10: A620 east of North Wheatley to Fledborough; and
- Route Section 11: Fledborough to High Marnham.

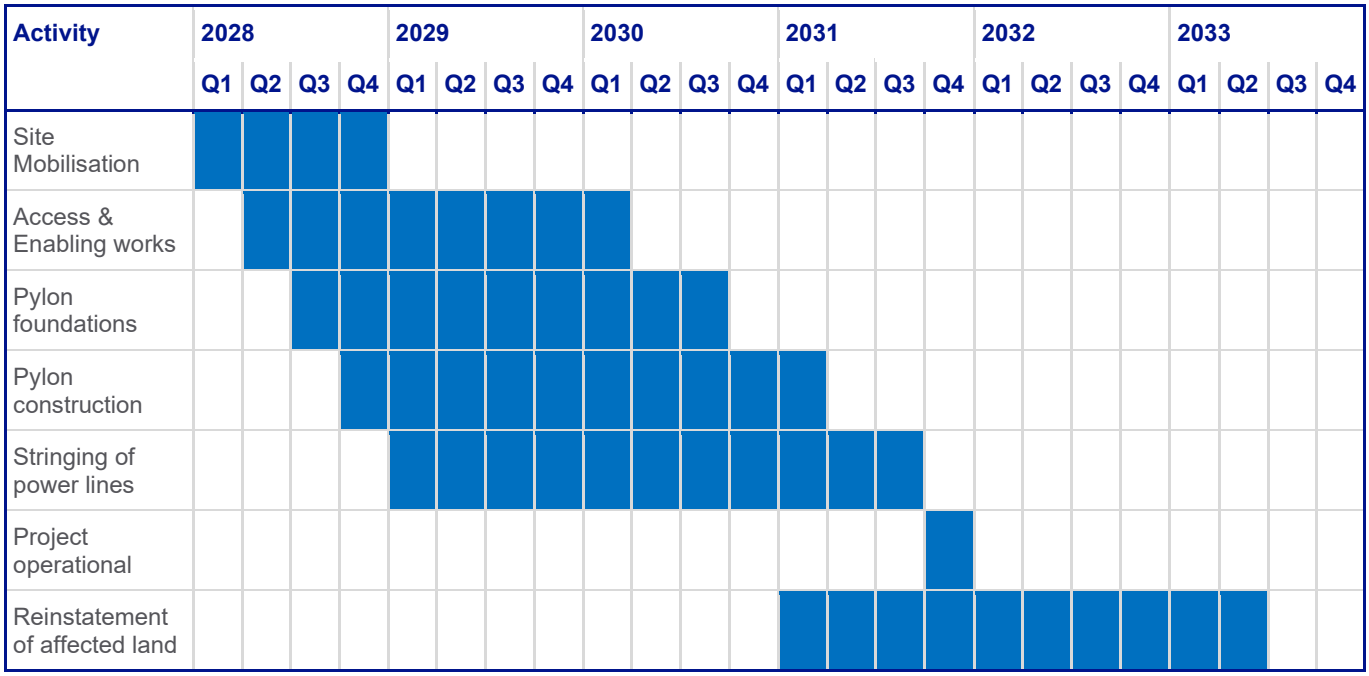
3.2 Construction Programme and Timings

3.2.1 If consent for the Project is granted, it is anticipated that access works and construction would commence in 2028. These initial works will include site clearance activities and the installation of construction compounds and access roads. It is expected that the main construction works would continue through to operational date of 2031, with reinstatement works continuing into 2033. Certain advanced works (such as archaeological trial trenching or protected species mitigation) may take place in advance of the construction period.

3.2.2 While the phasing of the construction programme is yet to be confirmed, further information will be included in the Environmental Statement.

3.2.3 An indication of the Project timelines from construction through to operation is provided in Image 3.1.

Image 3.1 - Indicative Project construction programme



4. Approach and Methodology

4.1 PEIR Approach and Methodology

4.1.1 EIA is a process for identifying the likely significant environmental effects (both positive and negative) of a proposed development.

What is the PEIR and EIA

4.1.2 The PEIR presents a preliminary assessment of the likely significant environmental effects of the Project, to inform consultation.

4.1.3 The purpose of the PEIR is to enable members of the public, consultation bodies, and other stakeholders, to develop an informed view of the preliminary likely significant effects of the Project and comment on aspects of interest (see section 6 on how to provide feedback). Feedback received through the consultation process will be used by National Grid to inform the ongoing development of the Project design, and additional measures to address any identified significant environmental effects.

4.1.4 The PEIR has been prepared at a point in time during the EIA process when the design of the Project is still being refined, the likely significant environmental effects are still being assessed and the potential for mitigation measures is being fed back into the design.

4.1.5 The full findings of the EIA process will be presented in an Environmental Statement that will be submitted as part of the application for development consent.

4.1.6 Key aims of the EIA process are to understand the current environmental conditions and predicted changes to them in the future (the 'baseline' and 'future baseline' respectively) and how those conditions may change as a result of a proposed project. Those changes are assessed in terms of how 'significant' they would be, and EIA is primarily concerned with 'likely significant effects' and not those considered unlikely to be significant. The EIA process also identifies and incorporates mitigation measures to avoid, reduce or offset any likely significant negative effects, which includes opportunities to enhance the environment through design.

4.1.7 Separate chapters within the PEIR present the detailed findings for each environmental topic that has been assessed for the Proposed Overhead Line, with a separate chapter that focuses on and details the preliminary likely significant effects of the construction, operation and maintenance of the Proposed Substation Works.

4.1.8 A detailed description of the existing 'baseline' and where relevant 'future baseline' has been produced for the draft Order Limits.[4] and where appropriate around it, through a combination of desk-based studies, engagement and consultation and site-specific surveys.

[4] Draft Order Limits is the term given to the boundary of land within which the Project is expected to be located and covers the construction, operation and where necessary the maintenance activities.

4.1.9 Consideration has then been given to how any potential effects could be avoided, reduced or offset. This is referred to as mitigation. Mitigation measures include those that are intrinsic to and built into the design of the Project (also known as 'embedded mitigation'); good practice control and management measures included within an Outline Code of Construction Practice, and other measures that are added to the design purely to mitigate an effect (also known as 'additional mitigation').

4.1.10 At this preliminary stage the surveys and assessment work have been progressed to differing degrees for different technical assessment, and mitigation measures have not all been defined or designed.

4.1.11 Following the identification of mitigation all preliminary residual[5] 'potential effects' arising from the construction and operation and maintenance of the Project have been identified, for example loss of habitat or change in noise levels. The assessment considers the level of significance of each effect on each 'receptor' (the receiving environment such as water, air, land or specific species). The assessment has been undertaken by a range of EIA specialists including but not limited to ecologists and archaeologists. The general approach to determining 'significance' of an effect is to consider the sensitivity of a receptor alongside the nature and severity of the change. Details of how effects have been determined to be significant or not significant for each topic is provided in each topic chapter of the PEIR.

4.1.12 All preliminary potential effects are considered as part of the EIA process. However, 'likely significant effects' are the key issues that are identified when considering the level and type of effect and the sensitivity of the environmental receptor.

4.1.13 EIA also requires the consideration of potential cumulative effects:

- Intra-project effects (also referred to as 'inter-relationships between topics') occur when a receptor, resource or group of receptors is potentially affected by more than one source of direct environmental impact resulting from the same development. For example, a community may be affected by noise and dust impacts resulting from the construction phase activities of a single development.
- Inter-project effects (also referred to as 'cumulative effects') occur when a resource or receptor or group of receptors is potentially affected by more than one development at the same time and the impacts act together additively and / or synergistically (IEMA, 2011). For example, the construction traffic effects of a development combined with the construction traffic effects of another development may result in additional cumulative effects on the surrounding highway network.

4.1.14 At this stage a preliminary assessment has been undertaken to identify the planned developments or other development within the area around the Project which has the potential to result in cumulative effects.

[5]After mitigation has been applied.

4.2 PEIR Structure

4.2.1 The PEIR comprises:

- Non-Technical Summary (this document).
- Volume 1: Main report.
- Volume 2: Figures.
- Volume 3: Appendices.
- Volume 4: Photomontages

4.3 Scoping, Consultation and Engagement

4.3.1 Engagement has been undertaken with consultees, stakeholders and other interested organisations.

Early Engagement

4.3.2 Central to the delivery of the EIA has been, and will continue to be, the focus on engagement with statutory and non-statutory consultees, community stakeholders, and other interested organisations and individuals.

4.3.3 A Scoping Report was submitted to the Planning Inspectorate in August 2023. The Scoping Report identified the potentially significant effects requiring assessment, the topics requiring assessment and the methods to be followed. The Planning Inspectorate subsequently provided its Scoping Opinion in September 2023, which included comments from a range of consultees.

4.3.4 The Scoping Opinion and associated consultee responses have informed both the preliminary environmental assessments and the development of the Project design.

Non-Statutory Consultation

4.3.5 In addition to the scoping process, a programme of ongoing non-statutory consultation and engagement has been, and continues to be, undertaken with key stakeholders to inform the Project's design.

4.3.6 The assessments reported in the PEIR have also been informed by non-statutory consultation undertaken by National Grid in 2023, and localised non-statutory consultation undertaken in 2024. Feedback received from both consultations is detailed within the Non-Statutory Consultation Feedback Report 2025, forming part of the statutory consultation material.

5. Preliminary Environmental Assessment

5.1.1 This section provides a summary of the preliminary assessments which have been undertaken to identify the likely significant effects of the Proposed Overhead Line associated with the following environmental topics:

- Landscape
- Visual
- Ecology
- Ornithology (Birds)
- Cultural Heritage
- Water Environment
- Geology and Hydrology
- Agriculture and Soils
- Traffic and Transport
- Air Quality
- Noise and Vibration
- Socio-economics, Recreation and Tourism
- Health and Wellbeing
- Climate Change
- Cumulative Effects

5.1.2 In addition to the above, an appraisal of the two substations and their potential environmental effects across the range of topics has been undertaken. This has been presented as a separate chapter (**Chapter 20 Substations and Associated Works**) within the PEIR and summarised within this NTS.

5.2 Landscape

Scope

5.2.1 The potential interaction between the Proposed Overhead Line and landscape receptors is assessed in **Chapter 6 Landscape** in Volume I of the PEIR. The preliminary assessment has considered effects on the following during construction and operation (and maintenance) of the Project:

- Landscape character and features, including effects upon the physical elements and upon the character and/or qualities of the landscape.

Study Area

5.2.2 The assessment study area extends 5 km from the draft Order Limits of the Project.

5.2.3 To inform the extent of the study area, a preliminary Zone of Theoretical Visibility (ZTV) map was produced based on the likely pylon heights within the Proposed Overhead Line. This map shows the geographical area over which the Proposed Overhead Line could potentially give rise to landscape effects up to a maximum distance of 10 km from the draft Order Limits of the Project. Although significant effects on landscape are unlikely at this distance, the ZTV was used to:

- Understand possible cumulative interactions with other developments;
- Ensure that taller elements, such as pylons, are fully evaluated; and
- Identify effects on distant landscapes.

Existing Baseline

5.2.4 The baseline has been identified using a range of information sources including Ordnance Survey Terrain modelling and mapping, landscape character assessments, aerial photography and designated landscape publications. Landscape surveys have also been undertaken to help identify viewpoints across the study area.

5.2.5 The landscape baseline throughout the study area is varied, to the north it ranges from large undulating arable field networks to the elevated topography of the Yorkshire Wolds to the low lying landscapes characterised as floodplains on either side of the River Ouse. To the central and southern part of the study area, the field parcel become smaller in size due to their historical association with the Isle of Axholme before expanding in the south of the study area. Throughout the study area, intermittent parcels of wooded areas, established hedgerows, treelined rivers and relatively steeper landform features provide both screening and a sense of rurality when away from settlements.

Mitigation

5.2.6 National Grid has included mitigation measures within the Project to avoid or reduce significant landscape effects. These include carefully choosing the locations and routes for infrastructure to achieve a good fit into the landscape and, where possible, placing new pylons parallel or close to existing overhead power lines to minimise their impact within the landscape.

5.2.7 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction of the Project to help the control and management of effects that could affect landscape character. These comprise measures such as retaining vegetation where practicable, protecting retained vegetation in close proximity to working areas, and implementing aftercare plans for planting.

Preliminary Assessment

5.2.8 The potential effects that could result from the construction and operation of the Proposed Overhead Line relate to changes to landscape character and/or the setting of designated landscapes, including vegetation removal and the presence construction

related activities such as compounds and the introduction of operational new infrastructure that extends to the planting of new trees and hedgerows.

5.2.9 The preliminary assessment has identified that significant construction and/or operational landscape effects are likely on a number of landscape characters throughout the Route Sections due to impacts on landscape elements and features. These would occur in all Route Sections with impacts considered greatest where new pylons would be introduced into landscapes where limited infrastructure is present, or where placing new overheard lines close to existing lines is not technically feasible. These effects are primarily focused on Route Sections 6, 8, 9, 10 and 11.

5.2.10 For those likely significant effects associated with the construction phase, further assessment will be undertaken as construction methods and durations are confirmed which may result in effects being reduced to levels considered not significant. This further assessment will be included within the Environmental Statement for the Project.

5.3 Visual

Scope

5.3.1 The potential interaction between the Proposed Overhead Line and visual receptors is assessed in **Chapter 7 Visual** in Volume I of the PEIR. The preliminary assessment covers effects on the following during construction and operation (and maintenance) of the Project:

- Visual amenity, including effects upon potential receptors (people) and viewing groups caused by changes in the appearance of the landscape.

Study Area

5.3.2 The study area for the preliminary assessment extends 5 km from the draft Order Limits of the Project.

5.3.3 To inform the extent of the study area, a preliminary Zone of Theoretical Visibility map was produced based on the likely pylon heights for the Proposed Overhead Line. This map shows the geographical area over which the Proposed Overhead Line could potentially give rise to visual effects up to a maximum distance of 10 km from the draft Order Limits of the Project. Although significant effects at this distance are unlikely, the 10 km radius for the Zone of Theoretical Visibility is used to:

- Understand possible cumulative interactions with other developments;
- Ensure that taller elements, such as pylons, are fully evaluated; and
- Identify effects on distant landscapes.

Existing Baseline

5.3.4 The baseline has been informed by a range desk based sources including Ordnance Survey Terrain modelling and mapping, landscape character assessments, aerial photography and designated landscape publications. This information has been supplemented by field surveys.

5.3.5 Visual receptors throughout the study area include residents on settlement fringes and or those that are relatively isolated such as farmsteads and small pockets of dispersed properties on the rural road network, users of the Public Rights of Way (PRoW) network and users of community assets and recreational facilities such as country parks and golf courses.

5.3.6 In the majority of Route Sections within the study area there are existing power lines and/or large scale existing and historical power generation such as Keadby and West Burton Power Stations, which are prominent features in views.

5.3.7 General views within the study area are typified as open and long ranging where lower hedgerows and landform allows. This is predominantly the case in floodplains such as in areas either side of the River Ouse (known as the Humberhead Levels), the designated landscape area of the Yorkshire Wolds, and to the west of the River Trent to the south.

5.3.8 Centrally with the study area, views of the existing power stations of Keadby and West Burton and surrounding infrastructure are visible, with treelined rivers and field parcels restrict distant views. This is particularly apparent in the northern extent of the Isle of Axholme before the views open up to the south where land is flat and well drained which allows for wider views.

5.3.9 To the southern extent of the study area, the landform is undulating which affords long views to the east towards the River Trent which quickly flattens into typical large arable field networks with established hedgerows, which results in more contained views.

Mitigation

5.3.10 National Grid has incorporated mitigation measures into the design of the Project to avoid or reduce significant effects. These include carefully choosing the locations and routes for infrastructure to fit better into the landscape and, where possible, placing new pylons parallel or close to existing overhead power lines to minimise the visual impact of overhead power lines.

5.3.11 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction of the Project to help the control and management of effects that could affect visual receptors. These include measures such as, retaining vegetation where practicable, protecting retained vegetation in close proximity to working areas with exclusion and root protection zones and implementing after care plans for planting.

Preliminary Assessment

5.3.12 The potential effects of the Proposed Overhead Line on visual receptors during construction and operation include temporary changes to views resulting from the introduction of construction activities, including construction compounds, temporary small site offices and access roads, construction plant and vehicle movements, topsoil stripping and earthworks and storage materials. Operational impacts would be associated with the introduction of tall infrastructure such as pylons into existing views.

5.3.13 The preliminary assessment concluded that significant construction and /or operational visual effects are likely on a number of receptors throughout the study area. These include views from settlement fringes, isolated residential properties and some views from settlements within the study area, views from transient users of PRoWs and in particular the Yorkshire Wolds Way National Trail, National Cycle Network routes and 7

Lake Country Park. In most instances however, the combination of distance and the presence of intervening landforms and vegetation would limit their impact.

5.3.14 As is the case for landscape impacts, visual impacts considered greatest where the new pylons are introduced into existing views where minimal pylon infrastructure is currently present or where close paralleling overheard new and existing lines are not technically feasible. These are primarily focused on Route Sections 8, 9, 10 and 11.

5.3.15 For those likely significant effects associated with the construction phase, further assessment will be undertaken as construction methods and durations are confirmed which may result in effects being reduced to levels considered not significant. This further assessment will be included within the Environmental Statement for the Project.

5.4 Ecology

Scope

5.4.1 The potential interaction between the Proposed Overhead Line and ecological receptors is assessed in **Chapter 8 Ecology** in Volume I of the PEIR. The preliminary assessment covers effects on the following receptors, during construction and operation (and maintenance) of the Project:

- Statutory designated sites.
- Non-statutory designated sites.
- Protected and notable habitats (including ancient woodland and habitats of principal importance).
- Terrestrial and aquatic biodiversity (including protected, notable, and non-native and invasive flora and fauna).

Study Area

5.4.2 The study area for the assessment comprises the area directly affected by the Project (the draft Order Limits) and a buffer around the draft Order Limits. The buffer can vary for different biodiversity receptors based on the area over which changes arising from construction and operation (including maintenance) of the Proposed Overhead Line could lead to ecologically significant effects.

5.4.3 A 2 km buffer was used as for all biodiversity receptors excluding the following:

- 5 km for statutory designated sites of national and local nature conservation value e.g., SSSIs.
- 10 km for statutory designated sites of international nature conservation value e.g., SACs, SPAs; and
- 30 km for SACs and SPAs where bats, cetaceans (a marine mammal, such as a whale or dolphin) or bird species with large foraging ranges are noted as qualifying features.

Existing Baseline

5.4.4 The existing baseline has been informed by a range of source information including but not limited to online local and national records, aerial photography and a range of species and habitat specific site surveys.

5.4.5 There are six internationally important designated sites within 10 km of the Draft Order Limits, three of which (The Humber Estuary SAC, The Humber Estuary SPA and the Humber Estuary Ramsar) are located within the draft Order Limits within Route Section 4. No SACs were identified within 30 km that are designated for bat conservation, or for cetaceans.

5.4.6 There are 36 other statutory designated sites of national importance (SSSIs/NNRs) within the study area. Four of which are located within the draft Order Limits. These are: Brantingham Dale SSSI (Route Section 2), The Humber Estuary SSSI (Route Section 4), Crowle Borrow Pits SSSI (Route Section 6) and the Chesterfield Canal SSSI (Route Section 8/9).

5.4.7 Nine locally important statutory sites designated for nature conservation (all Local Nature Reserves (LNR)) are located within the study area. None are located within the Order Limits.

5.4.8 131 non-statutory sites designated for biodiversity (Local Wildlife Sites (LWS), Candidate LWS, Historic LWS, Wildlife Trust Reserves and RSPB reserves) are located within the study area. Of these, 16 are located within the draft Order Limits.

5.4.9 There are 12 parcels of ancient woodland within 2 km study area and 17 currently identified veteran trees within the draft Order Limits. These surveys are ongoing and will be updated for inclusion within the Environmental Statement.

5.4.10 The majority of the land within the draft Order Limits comprises arable farmland with boundary features comprising hedgerows, ditches, and watercourses. Parcels of woodland (including part of Brantingham Dale Site of Special Scientific Interest (SSSI)), improved and semi-improved grassland and ponds are also present within the draft Order Limits.

5.4.11 There are a range of Priority Habitats within the draft Order Limits, these include deciduous woodland, lowland calcareous grassland, semi-improved grassland, coastal saltmarsh, mudflats, reedbed, lowland dry acid grassland, traditional orchard and lowland fens.

5.4.12 Protected and notable species known to be present within the study area include; badger, bats, great crested newts, hedgehogs, Atlantic salmon, grass snakes and otter and water vole.

5.4.13 Himalayan balsam an invasive non-native plant has been recorded within the study area.

Mitigation

5.4.14 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include carefully choosing the locations and routes for infrastructure to avoid or minimise disturbance to designated sites and supporting land features, particularly around the River Ouse, optimisation of construction related haul roads and routes and appropriate working distances from notable and or protected habitats.

5.4.15 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction of the Project to help the control and management of effects that could affect biodiversity features. These include measures such as, the management of dust, waste, water, noise, vibration, and soil, workers will undergo training to increase their awareness of environmental features, such as species and habitats, lighting will be managed to minimise disturbance and measures for the reinstatement of affected land.

Preliminary Assessment

5.4.16 Potential effects of the Proposed Overhead Line on ecology and biodiversity include both direct and indirect effects to habitat (or land functionally linked to it) and species from construction pollution (i.e., vibration, dust, air quality, light, noise and visual), temporary and permanent habitat loss/fragmentation/loss of habitat quality/function, harm/ mortality/ disturbance to species and the degradation/ fragmentation of retained habitats.

5.4.17 The preliminary assessment has concluded that significant construction effects are likely on the following designated sites and supporting habitat types: the Humber Estuary SAC/SPA/Ramsar site and SSSI, Brantingham Dale SSSI, Brantingham Dale Historic LWS, the River Torne Local Wildlife Site (LWS), South Engine Drain LWS and Folly Drain LWS. Habitat types include, woodland, hedgerows, broadleaved parkland, running water, coastal saltmarsh, mudflats and priority habitats.

5.4.18 On the baseline information currently held, the following protected and notable species: otter and water vole.

5.4.19 Further field surveys are planned for 2025, the findings and conclusions of these will be included within the Environmental Statement.

5.5 Ornithology

Scope

5.5.1 The potential interaction between the Proposed Overhead Line and ornithological (bird) receptors is assessed in **Chapter 9 Ornithology** in Volume I of the PEIR. The preliminary assessment covers effects on the following receptors, during construction and operation (and maintenance) of the Project:

- Birds; and
- land upon which they rely upon for migration, nesting and / or feeding.

Study Area

5.5.2 The study area for ornithology has been defined as zones of influence from the draft Order Limits. These are:

- 2 km for non-statutory designated sites of nature conservation value such as Local Wildlife Sites (LWSs);
- 5 km for statutory designated sites of national and local nature conservation value such as Sites of Special Scientific Interest (SSSIs) and National Nature Reserves (NNRs);

- 10 km for all other statutory designations of international nature designations; and
- 30 km for statutory designations such as Ramsar Sites and Special Protection Areas (SPAs) where bird species with large foraging and migratory ranges are a qualifying feature.

Existing Baseline

5.5.3 The existing baseline has been informed by a range of source information including but not limited to local record centre data, site specific bird counts from the Royal Society for the Protection of Birds (RSBP), Natural England, Joint Nature Conservation Committee (JNCC), aerial photography and local biodiversity plans.

5.5.4 In addition to the above, approximately two years of continual bird surveys have been undertaken to provide a better understanding of bird species and movements in study area.

5.5.5 There are two Ramsar sites, three SPAs, six SSSIs, one NNR, two LNRs and 22 LWSs within the respective study areas.

5.5.6 The study area includes species of bird such as; Cetti's warbler, bearded tit, barn owl, marsh harrier, avocet, bittern and pink footed geese. In terms of flight patterns, the highest proportion were identified immediately surrounding the River Ouse, with SPA qualifying species contributing to these recorded flight patterns. Further away from the River Ouse, these species were rarely recorded, and more typical bird species were seen such as barn owls, kingfishers, ducks and wild swans.

5.5.7 As flight patterns surveys are still ongoing more detailed, direction of flight in relation to habitat use, and interactions between birds and existing overhead power lines will be included in the Environmental Statement.

Mitigation

5.5.8 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include carefully choosing the locations and routes for infrastructure to avoid or minimise disturbance to designated sites and supporting land features, where possible, placing new pylons parallel or close to existing overhead power lines to minimise aerial obstacles.

5.5.9 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction phase to help control and management of effects that could affect ornithological receptors. These include measures such as, training of staff to identify the presence of nesting birds, protocols in the event nesting is identified within the works area, the protection and where possible the retention of vegetation and soils.

Preliminary Assessment

5.5.10 The preliminary assessment has concluded that the Proposed Overhead Line has the potential to result in likely significant effects during the construction and operation phases. These would result from:

Construction

- Permanent and temporary direct habitat loss and temporary disturbance and fragmentation of non-statutory designated sites.
- Permanent and temporary direct habitat loss and temporary disturbance and fragmentation of habitats utilised by protected and notable (which are considered endemic or rare, have conservation priority or ecologically important) bird species.
- Incidental mortality of breeding and non-breeding birds.
- Disturbance to protected or notable species from noise/vibration, visual and lighting.
- Changes in air quality on designated sites within 200 m of the construction traffic routes.
- Pollution impacts on designated sites and notable species.
- Loss/reduction in habitat quality used by protected/notable birds from changes in groundwater levels.

Operation

- Collision mortality on breeding and non-breeding birds due to new overhead power lines.
- Effects on protected and notable species via habitat fragmentation as a result of the Proposed Overhead Line creating a barrier to species dispersal.
- Habitat gains for some nesting bird species through the introduction of pylons.
- Increased predation effects from potential increased populations of predatory bird species on the Humber Estuary SAC /SPA/ Ramsar/ SSSI and breeding and non-breeding birds.

5.5.11 At present, the likely significant construction effects are primarily focused on where the Proposed Overhead Line crosses the Humber Estuary due its sensitivity and relationship to breeding and foraging grounds to north and south of the river.

5.5.12 During operation, potential significant effects are associated with new overhead power lines in proximity to the Blacktoft RSPB reserve, wider Humber Estuary and the fragmentation of Warping Drain Corridor LWS. These effects extend to individual species such as lapwing, little ringed plover, Oystercatcher, peregrine falcon, pink footed goose and turtle dove.

5.5.13 The assessment of the potential likely significant effects upon ornithological receptors will continue to be developed as more survey data is collected and analysed in addition to the refinement of the preliminary design of the Project.

5.6 Cultural Heritage

Scope

5.6.1 The potential interaction between the Proposed Overhead Line and cultural heritage receptors is assessed in **Chapter 10 Cultural Heritage** in Volume I of the PEIR. The preliminary assessment covers effects on the following during construction and operation (and maintenance) of the Project:

- Archaeological remains – designated and non-designated;
- Historic buildings – designated and non-designated; and
- Historic landscapes – non-designated.

Study Area

5.6.2 For the initial assessment, the study area for all cultural heritage sites, whether officially designated or not, extends 1 km from the draft Order Limits. This distance is considered enough to identify any unknown archaeological sites within the draft Order Limits and to assess potential changes to the setting of heritage sites, the surrounding landscape, and the type of asset.

5.6.3 For highly significant sites, like World Heritage Sites, Grade I and II* listed buildings, scheduled monuments, and conservation areas with many important assets, their settings might extend over a larger area. Therefore, the study area is extended up to 3 km from the draft Order Limits to include these highly significant sites, especially where the wider landscape is an important part of their significance.

Existing Baseline

5.6.4 The existing baseline has been informed by a range of source information such as local historic environment records, heritage lists, historic mapping and aerial photography. Where applicable and possible this has been supplemented with heritage focused site visits. The following is a summary of the existing baseline for the historic environment.

Designated Assets

5.6.5 Within the 1 km study area, there are, 12 scheduled monuments, one grade II Registered Park and Garden (RPG), Six conservation areas and 226 listed buildings of which seven are Grade I, 12 are Grade II*, and 207 are Grade II.

5.6.6 Within the 3 km study area, there are an additional 84 assets identified, these comprise 26 scheduled monuments, five conservation areas and 53 listed buildings, of which 20 are Grade I and 33 are Grade II*.

Non-Designated Assets

5.6.7 There are 1,683 non-designated assets are reported within the 1 km study area, of which 127 are either close to or within the draft Order Limits.

Archaeological and Historical Background

5.6.8 The baseline data indicates evidence of past human activity in the study area ranging from the Palaeolithic to the Post-medieval and Modern era. These range from organic

remains, barrows and crops, enclosures and ditches through to medieval moated manors.

Historic Landscapes

5.6.9 The Proposed Overhead Line traverses five National Character Areas (NCAs), with the three principal regions being the Yorkshire Wolds, the Humberhead Levels, and the Trent and Belvoir Vales. Notable historic landscapes within the 1 km study area include:

- Risby Hall: Encompasses scheduled monuments, a registered park and garden, and remnants of a former deer park and pleasure gardens.
- Yokefleet Hall: A degraded but historically interesting parkland estate.

5.6.10 The Isle of Axholme in North Lincolnshire is a locally designated landscape and is considered highly valuable, featuring well-preserved medieval features like strip fields and ridge and furrow.

Mitigation

5.6.11 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include carefully choosing the locations and routes for infrastructure to remove and avoid impacts upon identified cultural heritage as far as practicable, and where possible have diverted existing utilities which cross the draft Order Limits to avoid interaction with existing assets and features.

5.6.12 During construction of the Project a range of control measures will be implemented to manage potential interactions with known and unknown archaeology, these range from signposting areas of known archaeology to avoid disturbance to oversight of construction works by trained specialists who can stop works if necessary, in the event archaeology is identified.

5.6.13 Archaeological mitigation in the form of excavation and recording will be undertaken. This will be specified through a draft Heritage Mitigation Strategy and/or Outline Written Scheme of Investigation (WSI) to be submitted with the DCO application.

Preliminary Assessment

5.6.14 The preliminary assessment has identified that the following potential construction and operation effects may occur on heritage and or archaeological features.

Impacts on Setting

5.6.15 The introduction of pylons and overhead power lines into the landscape is expected to change the setting of a number of heritage assets, such as scheduled monuments, listed buildings, registered parks and gardens, and conservation areas, where setting often plays a vital role in their significance and appreciation. Examples of such impacts to setting include:

- Route Section 1: The introduction of taller pylons compared to the existing 4ZQ overhead power line is predicted to alter the setting of Risby Jacobean gardens, hall, and medieval settlement and Risby Hall Grade II Registered Park and Garden.

- Route Section 4: The Proposed Overhead Line's proximity to Hall Garth moated site including the presence of new pylons and an access track, is predicted to alter its setting despite the anticipated removal of an existing low voltage overhead power line currently within the site.
- Route Section 9: The introduction of pylons into the view of Beacon Hill Camp, a potential Iron Age hillfort is predicted to change its visual dominance over the landscape, a key aspect of its setting.
- Route Section 10: The Proposed Overhead Line would introduce new infrastructure into views from St Helen's Church, potentially further compromising its setting already affected by West Burton Power Station. The Proposed Overhead Line would also impact views of the Church of St Peter and St Paul, changing its prominence as a landmark.

Physical Impacts

5.6.16 Construction activities for the Proposed Overhead Line could physically damage heritage sites, especially non-designated archaeological sites within the draft Order Limits. Digging for pylons, roads, access tracks, and other infrastructure could directly remove or cut through archaeological deposits. Examples include:

- Route Section 2: Several Iron Age to Roman enclosures, ditches, and trackways could be impacted by groundworks for pylons, haul roads, and maintenance tracks.
- Route Section 3: Construction activities, including the erection of a large compound, could lead to the loss of archaeological remains associated with Brantingham Roman Villa, although the scheduled area itself would not be directly impacted. Other features like the Brough to York Roman Road a possible undated burial, and a medieval settlement could also be affected.
- Route Section 7: A large Iron Age circular enclosure is likely to be partially removed by construction of a pylon and haul road.
- Route Section 8: The construction of pylons, haul roads, and road upgrades is likely to impact several archaeological sites, including a Roman marching camp and undated enclosures, a Roman settlement and an undated cropmark complex.

5.6.17 The potential for previously unrecorded archaeological remains within the draft Order Limits. Further investigations, including desk-based assessments and archaeological evaluations, will be undertaken to understand the extent of this risk and inform mitigation strategies.

Impacts on Historic Landscapes

5.6.18 The introduction of new infrastructure, particularly in areas where it is not currently present, could detract from the character and legibility of these landscapes, impacting their overall value and understanding.

5.6.19 The Isle of Axholme has the potential to be subject to significant effects. This locally designated landscape, characterised by well-preserved medieval features, is crossed by the overhead power line in Route Sections 6 and 7, which is relatively free of infrastructure.

5.7 Water Environment

Scope

5.7.1 The potential interaction between the Proposed Overhead Line and water receptors is assessed in **Chapter 11 Water Environment** in Volume I of the PEIR. The preliminary assessment covers effects on the following:

- Hydromorphology, surface water quality and existing water interests (abstractions and discharges) during construction of the Proposed Overhead Line; and
- Land drainage and flood risk from all relevant sources, during construction and operation of the Proposed Overhead Line.

Study Area

5.7.2 The study area for the water environment assessment includes the area within the draft Order Limits and extends to a 500 m buffer around the draft Order Limits.

Existing Baseline

5.7.3 The existing baseline has been informed by a range of source information such as Ordnance Survey mapping, statutory main river maps, catchment data explorer databases, historic and current flood mapping water quality data. The following is a summary of the existing baseline for the water environment.

5.7.4 Within the study area there are numerous watercourses, ranging from major rivers like the River Ouse and River Trent to smaller streams, drains, and ditches associated with field drainage networks. The ecological and chemical status of the Water Framework Directive (WFD) water bodies within the study area varies, with some achieving moderate status while others exhibit poor or failing status. Reasons for not achieving good status can be attributed to factors like pollution from sewage discharges, agricultural runoff, and physical modifications.

5.7.5 Many watercourses, particularly those serving land drainage functions have been identified as being heavily modified from their natural state, to more straightened ditches with uniform banks. This is particularly evident in areas managed by Internal Drainage Boards (IDBs), such as the East Riding of Yorkshire IDB and the Isle of Axholme IDB.

5.7.6 The majority of the Route Sections are primarily located within flood zones 1 and 2 with smaller isolated pockets of flood zone 3 (indicating a high risk of flooding) with the exception of Route Section 3 and 4 which are located within the floodplains of the River Ouse and River Trent, which is classified as flood zone 3.

5.7.7 Route Sections 8, and 9 are located within Drinking Water Protected Areas or Safeguard Zones which are areas designated for the protection of water for consumption.

Mitigation

5.7.8 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include; where possible crossing points will be at the narrowest point of rivers, ponds will be avoided, and pylons would be located as far as practicable outside of appropriate standoff distances from watercourses.

5.7.9 During construction of the Project a range of control measures will be implemented to manage potential interactions with the water environment, these include, management of run off from construction working areas, fuels, oils and chemicals will be stored responsibly, wash down of vehicles will occur in designated spaces, and consultation with landowners of drainage arrangements will occur to minimise disturbance.

5.7.10 A flood risk assessment will be undertaken for the Project to confirm that the Project would not increase the likelihood of flood events happening where new pylons and or buildings are constructed.

Preliminary Assessment

5.7.11 Potential effects of the Proposed Overhead Line on hydrology and land drainage receptors include increased runoff rates and volumes, pollution, temporary loss of floodplain storage/impediment of floodplain flows and temporary physical disturbance.

5.7.12 Where there would be a need to cross smaller watercourses and ditches to construct the overhead power line and associated works, these would be undertaken using culverts or the use of clear span bridges across smaller rivers, which would allow construction traffic to pass over. Standard practice measures would reduce pollution risks and the potential effects of the temporary watercourse crossings, therefore, effects on watercourses are anticipated to be not significant. Any potential effects on water quality are considered to be temporary and localised and not significant.

5.7.13 There is also the potential for an increase in surface water run off as a result of the temporary surfaces laid for construction compounds and access tracks. Whilst these are likely to temporarily alter run off rates, with the introduction of control and management mitigation measures such as temporary field drains and drainage routes, it is predicted the changes to runoff would not be significant.

5.7.14 There is the potential for the Proposed Overhead Line to increase flood risk during construction. However, the Flood Risk Assessment will outline the proposed mitigation measures/commitments to ensure no detrimental effects on flood risk from rivers and the sea. Therefore, the effect is anticipated to be not significant.

5.7.15 Once construction is complete land temporarily affected, and any associated land drainage would be reinstated.

5.8 Geology and Hydrogeology

Scope

5.8.1 The potential interaction between the Proposed Overhead Line and geological and hydrogeological receptors are assessed in **Chapter 12 Geology and Hydrogeology** in Volume I of the PEIR. The preliminary assessment covers effects on the following during construction of the Proposed Overhead Line:

- Contaminated land and the receptors that could be affected by existing contaminants within the soil.
- Geology including designated geological sites and minerals.
- Hydrogeology including groundwater quality, levels, and flow.

Study Area

5.8.2 The study area comprises of the draft Order Limits, plus a 250 m buffer for geology and contaminated land and up to 500 m for hydrogeology.

Existing Baseline

5.8.3 Baseline conditions have been gathered from desk-based information using information from existing records including British Geological Survey (BGS) geological mapping, hydrogeological maps, Multi-Agency Geographic Information for the Countryside (MAGIC) interactive map, available historical mapping, information from Local Authorities and information held by the Environment Agency.

Contamination

5.8.4 Historical mapping shows the majority of the draft Order Limits and study area is indicated to have remained as undeveloped/agricultural land. In these areas it is considered that there is a very low risk of a significant source of potential contamination.

Geology and Hydrogeology

5.8.5 There are three Local Geological Sites (LGSs) within the study area. These are:

- A dismantled railway line in Little Weighton LGS (chalk exposure) and Brantingham Dale Plantation LGS (a dry valley landscape) both located within in Route Section 2; and
- Melwood Park LGS located within Route Section 7.

5.8.6 Superficial deposits present within the study area are classified as follows:

- Secondary A Aquifer - Bielby Sand Member, Alluvium, Warp, Breighton Sand Formation. Sutton Sand Formation, Glaciofluvial deposits, Holme Pierrepont sand and gravel member;
- Secondary Undifferentiated Aquifer - Till (Devensian and Mid Pleistocene) and Head Deposits; and
- Unproductive Strata - Hemingbrough Glaciolacustrine Formation and Peat.

5.8.7 Bedrock deposits present within the 500 m study area are classified as follows:

- Principal Aquifer - Burnham Chalk Formation, Welton Chalk Formation, Ferriby Chalk Formation, Hunstanton Formation, Brantingham Member, Upper Lincolnshire Limestone Member, Lower Lincolnshire Limestone Member;
- Secondary A Aquifer - Kellaways Sand Member, Thorncroft Sand Member, Frodingham Ironstone;
- Secondary B Aquifer - Mercia Mudstone, Scunthorpe Mudstone Formation;
- Secondary Undifferentiated - Clarborough Member, Charmouth Mudstone Formation, Penarth Group; and
- Unproductive Strata - Ancholme Group, Whitby Mudstone Formation.

5.8.8 The majority of the study area is not within:

- a groundwater Source Protection Zone (SPZ). However, a small part of the draft Order Limits and study area within Route Section 1 and Route Section 2, where the draft Order Limits crosses a SPZ 1 and associated SPZ 2 and SPZ 3[6].
- are not located within a groundwater Drinking Water Safeguard Zone (DWSZ), with the exception of those small areas noted above that are within the groundwater SPZ's.

5.8.9 Groundwater within the majority of the study area is classified as 'high' or 'medium-high' vulnerability. Within small discrete sections of the draft Order Limits the groundwater is classified as 'medium' or 'low', and these are coincidental with areas where clay rich, low permeability, superficial deposits are located overlying the bedrock deposits or where the bedrock is identified as being Unproductive Strata or a Secondary Undifferentiated Aquifer.

Mitigation

5.8.10 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include avoiding sensitive receptors and features as far as practicable such as landfills and geological sites.

5.8.11 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction of the Project to help the control and management of effects that could affect contaminated land, geology and hydrogeology receptors. These include measures such as; undertaking ground investigations to inform design, appropriate training of workforce, the control of earthworks and materials movements, protocols for dealing with unexpected contamination and the correct use and storage of chemicals and fuels.

[6] SPZ's are areas designated to protect groundwater sources, such as wells and springs, from contamination. SPZ1 is the area closest to the water source, SPZ2 surrounds SPZ1 and SPZ3 encompasses the entire area that contributes groundwater to the source.

Preliminary Assessment

5.8.12 The potential effects that could result from the construction of the Proposed Overhead Line are:

- Potential for exposure to existing contamination and the mobilisation of existing contamination as a result of ground disturbance from construction activities including piling, on sites that are identified as being a moderate or above risk;
- Potential for effects on local geological designated sites from ground disturbance during construction.
- Potential effects on a reduction in groundwater levels, quality and flows from dewatering activities to reduce groundwater levels at trenchless crossing locations (which are crossings undertaken using machinery that bores/digs a horizontal tunnel through the ground); and
- Connection of aquifer units creating potential pathways due to excavations at trenchless crossing locations.

5.8.13 The preliminary assessment concluded that effects from the construction phase would be not significant in relation to contaminated land, geology and hydrogeology.

5.9 Agriculture and Soils

Scope

5.9.1 The potential interaction between the Proposed Overhead Line and agricultural and soil receptors are assessed in **Chapter 13 Agriculture and Soils** in Volume I of the PEIR. The preliminary assessment covers effects on the following, during construction and operation (and maintenance) of the Proposed Overhead Line:

- Soils.
- Agricultural Land Classification (ALC), including Best and Most Versatile (BMV) land.
- Land Use.

Study Area

5.9.2 The study area for the assessment comprises the draft Order Limits and a 1 km buffer around the draft Order Limits.

Existing Baseline

5.9.3 A desk study was undertaken drawing on information from existing mapping from the British Geological Survey, Ordnance Survey, Soilscape mapping, Agricultural Land Classification (ALC) mapping and maps of agri-environmental, woodland and forestry schemes.

Geology

5.9.4 The solid geology in the northern part of the study area, west of Hull and north of the Humber Estuary, mainly consists of Burnham Chalk Formation, which is sedimentary rock formed between 93.9 and 83.6 million years ago during the Cretaceous period.

As the route goes south, most of the remaining area is underlain by Mercia Mudstone Group, sedimentary rock formed between 252.2 and 201.3 million years ago during the Triassic period.

5.9.5 Within the northern section (west of Hull and north of the Humber Estuary), superficial deposits are present, comprising alluvial and till deposits. South of the Humber Estuary, extensive areas of alluvium and Warp silt and clay are present within the floodplains of the River Trent and its tributaries.

Soils

5.9.6 The soil types which have formed in this geology vary across the study area. The predominant soil types are identified as loamy and clayey soils of coastal flats with naturally high groundwater in the areas surrounding the River Humber. The soil types across the rest of the study area are primarily described as slightly acidic loamy and clayey soils with impeded drainage.

5.9.7 There are also locations mapped as comprising fen peat and raised bog peat soils to the west of Scunthorpe.

Agricultural Land Classification

5.9.8 Provisional ALC mapping shows that the study area comprises extensive areas of Best and Mose Versatile land such as Grade 2 land, as well as some Grade 1 land within the draft Order Limits between Route Sections 1 and 8. South of the Chesterfield Canal (Route Sections 9, 10, and 11) the land is predominately mapped as Grade 3 land.

Land use

5.9.9 A desk-based assessment using detailed aerial photography and Ordnance Survey Mapping has shown that the land use across the draft Order Limits appears to be a combination of arable and pastureland. Across the study area there are various areas of land under Countryside Stewardship Agreements (Middle and Higher Tier), areas designated under various Environmental Stewardship Agreement Levels, and parcels of land under Woodland Grant Schemes. The draft Order Limits also pass close by areas of urban infrastructure including large cities such as Hull.

Mitigation

5.9.10 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include siting assets in a way that reduces overall land take and disturbance to working parcels of land to maximise their continued use and viability.

5.9.11 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction phase to help the control and management of effects that could affect agriculture and soil receptors. These include reinstatement of land used temporarily to its pre-construction condition and use; undertaking works in accordance with standard practice soil handling techniques; and where practicable and safe to do so, maintaining access to land and field access points throughout the construction period.

Preliminary Assessment

5.9.12 The Proposed Overhead Line could affect agriculture and soils by causing temporary and permanent loss of Best and Most Versatile (BMV) land needed for construction and operation (including maintenance). Losing BMV land, whether temporarily or permanently, may result in significant effects.

5.9.13 There is also the potential for soil handling during construction to affect soil properties and therefore affect soil function[7] and soil quality. It is considered that effects on soil quality and its associated ecosystem services would be significant during construction.

5.9.14 The Proposed Overhead Line has the potential to affect agricultural operations during construction and operation (including maintenance works). However, with standard practice measures implemented during these phases, effects are considered to be not significant.

5.10 Traffic and Transport

Scope

5.10.1 The potential interaction between the Proposed Overhead Line and traffic and transport receptors are assessed in **Chapter 14 Traffic and Transport** in Volume I of the PEIR. The preliminary assessment covers effects on the following during construction of the Proposed Overhead Line:

- Increase in baseline traffic flows as a result of the Proposed Overhead Line, due to the use of the surrounding local highway network being used by construction vehicles; and
- Changes to the existing public rights of way.

Study Area

5.10.2 The study area for the assessment has been defined based on the area where there is likely to be transport effects resulting from the construction of the Proposed Overhead Line. This includes routes along which heavy goods vehicles (HGVs), light goods vehicles (LGVs) and construction worker vehicles would travel during the construction of the Proposed Overhead Line, collectively these are known as Primary Access Routes (PARs).

5.10.3 The study area contains the roads that form part of the PARs, to and from the Proposed Overhead Line up to its connection with the Strategic Road Network (SRN) and Major Road Network (MRN). Where required, the study area also includes PRoWs, bridleways, national cycle paths.

[7] Soils provide a range of functions (which deliver a range of soil ecosystem services), such as a medium for plant (including food and biomass) growth, regulating water, storing carbon, a biological habitat, a platform for structures and supporting cultural heritage. These functions and the associated ecosystem services are delivered best when soils are healthy; soil quality refers to the ability of soils to continue to function in the long-term in a way that is appropriate to the soil characteristics.

Existing Baseline

5.10.4 The existing baseline has been informed by a desk study which has drawn on the following information sources: automatic traffic counts from radar and cameras, review of the highway network to identify constraints such as height and width restrictions, parking provisions and capacity issues. The most prominent surrounding highway network, part of the SRN / MRN is the: A1079, A63, A18, A161, M180, B1403, A631 and the A57.

Mitigation

5.10.5 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include constructing a haul road to remove as far as practicable the construction related traffic movements from the local road network, and the widening of existing roads to improve road capacity and allow for more direct construction traffic movements to the haul road.

5.10.6 Standard mitigation is included within **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR which would help the control and management of impacts that could affect traffic and transport. This includes the creation of a Construction Traffic Management Plan which will set out measures to reduce route and journey milage to and from, as well as around the site and prevent nuisance to the residents, businesses and wider community caused by parking, vehicle movements and access residents.

Preliminary Assessment

5.10.7 The preliminary assessment has concluded that there is the potential for significant effects within the PARs. These effects are associated with a reduction in road safety, non-motorised amenity, pedestrian and driver delay.

5.10.8 In addition to the above, several sections of PRoWs would require temporary diversions where they would interface with construction activities. These diversions would be relatively minor and would not significantly alter the journey length. One PRoW would require a larger diversion, and one would require stopping up. These are in proximity to the area of the proposed Birkhill Wood substation.

5.10.9 Standard mitigation measures will be implemented to reduce as far as practicable the temporary effects and minimise disruption to road and PRoW users. The Project will continue to be refined as part of the iterative design process and where possible these impacts will be minimised further and presented within the Environmental Statement.

5.11 Air Quality

Scope

5.11.1 The potential interaction between the Proposed Overhead Line and air quality receptors is assessed in **Chapter 15 Air Quality** in Volume I of the PEIR. The preliminary assessment covers the effects of the following during construction of the Proposed Overhead Line:

- Dust.
- Traffic emissions.
- Generator and Non-Road Mobile Machinery emissions.

Study Area

5.11.2 The study area for construction phase dust is:

- 250 m from the draft Order Limits for human receptors and up to 50 m for ecological receptors; and
- 50 m from the route(s) used by construction vehicles on the public highway, up to 250 m from the proposed bellmouths.

5.11.3 The study area for construction traffic emissions has been determined from Primary Access Routes and predicted traffic numbers. Where necessary human and ecological receptors within the affected road network are scoped into the assessment.

Existing Baseline

5.11.4 A review of the existing baseline has been undertaken to establish an understanding of the baseline air quality environment to identify areas that are likely to be sensitive to changes in emissions as a result of the construction of the Proposed Overhead Line. This was established through a desk study and through the use of existing monitoring data collected by the relevant local authorities. The review shows that there are no Air Quality Management Areas (AQMAs) within the draft Order Limits and the existing monitoring undertaken by Department for Environment, Food & Rural Affairs (DEFRA) on background pollutant concentrations show that across the draft Order Limits show they are well below the annual mean objectives.

5.11.5 There are a number of human and ecological receptors surrounding the Project. This includes but not limited to human receptors within the settlements of Skidby, Little Weighton, Brantingham, Ellerker, Broomfleet, Yokefleet, Ousefleet, Crowle, Ealand, Belton, Beltoft, Owston Ferry, Sturton le Steeple, East Drayton and Darlton. Ecological receptors include but not limited to: the Humber Estuary designated sites, Brantingham Dale SSSI, Crowle Borrow Pits SSSI and Chesterfield Canal SSSI.

5.11.6 There are also schools within 250 m of the draft Order Limits, including those in Crowle and Owston Ferry, and a hospital within 250 m of the draft Order Limits in Woodbeck.

Mitigation

5.11.7 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include designing the overhead power line to avoid large residential and urban areas, and thus areas of typically poor air quality, and the incorporation of haul roads to reduce the number of traffic movements on the local road network during construction.

5.11.8 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction of the Project to help the control and management of effects that could affect air quality. These include: the locating of equipment away from sensitive receptors, correctly maintained vehicles which are washed down to minimise dust dispersion, stockpiled materials will be covered and the implementation of a Construction Traffic Management Plan to clearly identify permitted haul routes and interfaces points with the local road network.

Preliminary Assessment

5.11.9 The provisional construction traffic data indicates that there is the potential for an increased amount of construction traffic movements on some sections of the road network used by construction vehicles. These may include sections of the A164, the M62, the A161, the M180, Brough Road, Tongue Lane and Main Street (Skidby). Part of the A63 is located within Kingston-upon-Hull City Council's Hull AQMA No.1(A).

5.11.10 This may result in the need for detailed modelling of construction traffic routes at the following locations: sections of the A164, the A63, the M62, the A161, the A63 and the M180, Brough Road, Tongue Lane and Main Street (Skidby). Further assessment is required of the traffic data to confirm the extent of potential effects.

5.11.11 Initial preliminary outcomes from the ongoing air quality assessment indicate that with the implementation of measures set out within the Outline CoCP, effects from construction dust would be considered not significant. Due to the low background pollutant concentrations, it is predicted that effects from Non-Road Mobile Machinery on residential and ecological receptors would be not significant.

5.12 Noise and Vibration

Scope

5.12.1 The potential interaction between the Proposed Overhead Line and noise and vibration receptors are assessed in **Chapter 16 Noise and Vibration** in Volume I of the PEIR. The preliminary assessment covers effects from the following:

- Construction noise.
- Construction vibration.
- Construction traffic noise.
- Operational noise from the proposed new Substations and the overhead power line.

Study Area

5.12.2 A baseline assessment has been informed by a desk-based study and existing site surveys. A buffer of 300 m from the draft Order Limits / proposed construction works has been used for the construction noise study area, with a buffer of 100 m for construction vibration impacts. The study area also included a 50 m buffer from construction traffic routes. The study area for operational noise is 60 m from the extent of the operational elements of the Proposed Overhead Line.

Existing Baseline

5.12.3 The existing baseline has been informed by a desk study which has drawn on the following information sources: DEFRA strategic noise mapping, Ordnance Survey mapping and Ordnance Survey AddressBase Plus data (data which identifies the geographically locates of each residential property with a postcode).

5.12.4 Within the study area across the 11 Route Sections, there are 835 residential Noise Sensitive Receptors, 27 settlements and no Noise Important Areas.

5.12.5 The draft Order Limits also crosses over or is located close to a number of transport links. The noise and vibration study area includes a mix of built-up areas and rural environments.

5.12.6 The noise climate away from built-up areas and main transport links is therefore considered to have low ambient and background noise levels, with the study area being rural in nature. It is assumed that existing vibration levels are negligible in the study area.

Mitigation

5.12.7 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include avoiding settlements and residential areas as far as practicable passing predominantly through rural areas; and technical specifications of the infrastructure such as insulators, dampers are designed in accordance with current specifications which would reduce the potential for audible noise being emitted.

5.12.8 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction phase to help the control and management of effects that could affect noise and vibration receptors. These include the locating of equipment away from sensitive receptors, construction working will adhere to the agreed working hours and best practicable means (BPM) would be employed to reduce construction noise and vibration.

Preliminary Assessment

5.12.9 The potential effects of the Proposed Overhead Line on noise and vibration include potential noise and vibration impacts from construction activities, increased road traffic and vibration due to additional movement from construction traffic on the public highway. The preliminary assessment has concluded that with the implementation of control and management mitigation as outlined within the draft CoCP, construction effects on Noise Sensitive Receptors from noise and vibration would be not significant.

5.12.10 Based on the current construction traffic information, the construction traffic noise from construction routes has concluded that the effect of the construction traffic noise is considered to be not significant.

5.12.11 There are 19 Noise Sensitive Receptors located within the 60 m study area for operational noise. At this stage, baseline noise surveys have not been completed and as such it is not possible to provide an operational noise assessment within the preliminary assessment.

5.12.12 Further assessment of construction noise, construction vibration and operational noise will be undertaken and presented in the Environmental Statement.

5.13 Socio-economics, Recreation and Tourism

Scope

5.13.1 The potential interaction between the Proposed Overhead Line and socio-economic, recreation and tourism receptors are assessed in **Chapter 17 Socio-economic, Recreation and Tourism** in Volume I of the PEIR. The preliminary assessment covers potential effects on the following:

- Employment (including training and apprenticeship opportunities);
- The local economy effects from the generation of Gross Value Added (GVA) from employment, training, and apprenticeship opportunities;
- Users of recreational routes and Public Rights of Way (PRoW) (including bridleways and cycle paths);
- Local communities that could be affected by community severance; and
- Residential receptors, local businesses, visitor attractions, community facilities, open space, and development land.

Study Area

5.13.2 The effects of the Proposed Overhead Line with respect to Socio-economics, Recreation and Tourism are considered at varying spatial levels according to the likely spatial extent of the effect under consideration.

Existing Baseline

5.13.3 The baseline for this topic includes the population and deprivation, employment and economic activity, community facilities, businesses, recreation and tourism assets, recreational routes and public rights of way (PRoW), recreational land and open space.

5.13.4 In order to understand the existing socio-economic, recreation, tourism, and health and wellbeing baseline, data has been collected through a desk-based study using publicly available sources and documents. Data covers ethnicity, deprivation, housing and employment, local health, mental health and vulnerable groups. Data shows that across the study area statistics vary between the local authorities, in comparison with the National average.

5.13.5 In summary, at the time of last National Census in 2021, in the Direct Impact Area (DIA), the resident population in 2021 was 47,894 of that 26% were aged 65+ years old. For the Wider Study Area (defined as East Riding of Yorkshire, North Lincolnshire and the Bassetlaw District Council local authorities) the total population was 629,700, of which 24% of the population were aged 65+, compared to England's 18%.

5.13.6 For economic activity the DIA has an economic activity rate of 57%, 3% lower than the national average (59%). For the Wider Study Area (56%), which is less than the average for England (59%). The DIA has a larger proportion of residents in very good health (45.7%) compared to the Wider Study Area (43.9%), however the proportion is lower than the national average (48.5%).

5.13.7 A number of unlicenced airfields are located within the study area. There is no public data on aircraft movements at the identified airfields. The baseline data gathered on airfields (e.g., the type of airfield and number of employees) has been collected from engagement with the identified airfields and information provided on the webpage of the airfields.

5.13.8 In addition to the above, within the study area there are:

- 30 community facilities ranging from primary schools to places of worship;
- two residential properties within the draft Order Limits and a number of settlements throughout the Route Sections;
- 74 business, seven unlicenced airstrips, recreational and tourism receptors, which range from holiday parks to yoga studios;
- 55 areas of recreational land and open spaces; and
- 43 sections of PRoWs, 9 sections of national trails and 5 sections of national cycle routes.

Mitigation

5.13.9 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include: routeing to avoid as far as practicable sensitive features such as businesses, community assets, healthcare and education facilities. The Project will be designed to current standards for Electromagnetic Frequency emissions and technical specifications such as insulation and dampers.

5.13.10 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction phase to help the control and management of effects that could affect socio-economic factors, recreation and tourism. These include measures to manage dust, waste, water, noise, vibration and soil during construction, informing members of the community and local businesses about construction activities through active community liaison, management of public rights of way disruptions and retaining vegetation where practicable.

Preliminary Assessment

5.13.11 Construction activities have the potential to result in temporary access disruption to several businesses, recreational land, community facilities, including schools, churches, and village halls. The following are predicted to experience significant effects during the construction phase:

- Ealand Victory Hall (Route Section 6);
- All Saints Parish Church, Misterton (Route Section 8);
- St Martin's Church, Saundby (Route Section 9);
- Birkhill Wood LWS and Risby Park LWS (Route Section 1);
- Gilberdyke Garden Centre and Newton Kennels (Route Section 3); and
- West Burton Airstrip (Route Section 10).

5.13.12 During operation there may be the need to permanently close West Burton Airstrip. In addition, there would be one permanent closure planned at the Birkhill Wood Access PRoW, with several PRoWs and recreational routes requiring temporary diversions and management measures during the construction phase. With mitigation measures in place these effects on PRoWs are predicted to be not significant.

5.14 Health and Wellbeing

Scope

5.14.1 The potential interaction between the Proposed Overhead Line and health and wellbeing receptors are assessed in **Chapter 18 Health and Wellbeing** in Volume I of the PEIR. The preliminary assessment covers effects on the following:

- Health-related environmental change (for example, air quality, noise, traffic, and transport related effects) during construction and operation (and maintenance) of the Proposed Overhead Line relating to:
  - Both physical and mental health and wellbeing.
  - Both the general population, and vulnerable groups/ communities (defined by characteristics such as age, ethnicity, economic status, disability, sex/ gender) who may be disproportionately affected by such changes.

Study Area

5.14.2 The study area for Health and Wellbeing has been defined using professional judgement and experience of other similar linear projects. The study area is defined by the draft Order Limits (the direct impact area), and the boundaries of the Local Authorities (wider study area) in which the Proposed Overhead Line is located. This allows for a better understanding of the health and wellbeing trends in which the Proposed Overhead Line would be located within.

5.14.3 The Health and Wellbeing assessment also takes account of the study areas of related topics that may affect environmental change, notably **Chapter 6 Landscape**, **Chapter 7 Visual**, **Chapter 11 Water Environment**, **Chapter 14 Traffic and Transport**, **Chapter 15 Air Quality**, **Chapter 16 Noise and Vibration**, **Chapter 17 Socio-economics, Recreation and Tourism** and **Chapter 19 Climate Change**.

Existing Baseline

5.14.4 The baseline information presented within Socio-economic, Recreation and Tourism section above is applicable for both those topics and Health and Wellbeing. In addition, there are specific health factors such as taken from the last National Census in 2021.

5.14.5 The Direct Impact Area has a larger proportion of residents in very good health (45.7%) compared to the Wider Study Area (43.9%), however the proportion is lower than the average regionally (46.2% in both the East Midlands and Yorkshire and the Humber) and nationally (48.5%). The Direct Impact Area did however have a larger proportion of residents in good health (35.5%) and fair health (13.8%) compared to the national average. The Direct Impact Area also had the lowest proportion of residents in very bad health (1.1%).

5.14.6 Within the Direct Impact Area there are 18.2% of people considered disabled under the Equality act, which is larger than the average across England (17.3%).

5.14.7 The health assessment also takes account of baseline data presented in Air Quality, Contaminated Land, Geology and Hydrogeology, Hydrology and Land Drainage, Landscape and Visual, Noise and Vibration, Socio-economics, Tourism and Recreation, and Traffic and Transport Chapters in Volume 1 of the PEIR.

Mitigation

5.14.8 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include: routeing to avoid as far as practicable sensitive features such as community assets, healthcare and education facilities. The Project will be designed to current standards for Electromagnetic Frequency emissions and technical specifications such as insulation and dampers.

5.14.9 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the standard mitigation to be implemented during the construction of the Project to help the control and management of effects that could affect health and wellbeing. These include measures to manage dust, waste, water, noise, vibration and soil during construction, informing members of the community and local businesses about construction activities through active community liaison, management of public rights of way disruptions and retaining vegetation where practicable.

Preliminary Assessment

5.14.10 The potential effects of the Proposed Overhead Line on health and wellbeing include the creation of additional jobs, changes to landscape character and visual amenity effects, increased traffic flows and severance effects, potential changes to air quality during construction, potential disruption of business and recreational facilities and potential influences on noise levels. However, the preliminary assessment has concluded that effects would be not significant in relation to health and wellbeing.

5.15 Climate Change

Scope

5.15.1 The potential interaction between the Proposed Overhead Line and climate change receptors is assessed in **Chapter 19 Climate Change** in Volume I of the PEIR. The preliminary assessment covers potential effects on the following:

- Greenhouse gas emissions; and
- Climate change in terms of in-combination climate change impacts with other developments and the resilience of the Proposed Overhead Line to future climate change events.

Study Area

GHG Impact Assessment

5.15.2 The study area for the greenhouse gas (GHG) emissions assessment includes all direct GHG emissions from activities within the draft Order Limits during the construction and operation of the Proposed Overhead Line. It also considers indirect emissions from the energy used to extract and produce construction materials, as well as emissions from transporting materials, waste, and construction workers to and from the Project site during construction.

5.15.3 For the construction phase, the GHG study area covers the construction works within the draft Order Limits. For the operational phase, it includes direct emissions from energy use within this boundary.

Climate Resilience Assessment

5.15.4 The study area adopted for the climate change resilience assessment comprises the draft Order Limits, which captures all National Grid assets and infrastructure associated with the Proposed Overhead Line (including all temporary works).

In-combination Climate Assessment

5.15.5 The study area for the in-combination climate impact assessment reflects the study areas adopted within other environmental topic assessments, where in-combination climate impacts are predicted to occur.

Existing Baseline

5.15.6 The following sources and types of information have been used in the assessment:

- Information relating to the current design of the Proposed Overhead Line.
- Information and records relating to historic climate data.
- Data relating to future climate projections for the UK.

Mitigation

5.15.7 National Grid has embedded mitigation measures into the design of the Project to avoid or reduce significant effects, these include: sensitive routeing and siting of infrastructure and temporary works, and the engaging with the supply chain to identify materials and processes that can reduce the overall carbon emissions of constructing and operating the Project.

5.15.8 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction phase to help the control and management of effects that could affect Climate Change. These include measures to manage dust, waste, water, noise, vibration and soil during construction. Vehicles will be correctly maintained, and all plant will have engines switched off so as to not idle and the Construction Traffic Management Plan will set out routes of travel to increase the efficiency of construction traffic movements and thus reduce mileage as far as practicable.

Preliminary Assessment

5.15.9 The overall estimated GHG emissions of the Proposed Overhead Line contribute to less than 0.1% of the UK carbon budget (1.725 million tonnes of carbon dioxide). Although the construction and operation of the Proposed Overhead Line would directly result in increased GHG emissions consideration needs to be given to its role in wider UK policy to decarbonise the electricity grid. Over its lifetime, the Proposed Overhead Line would provide a key contribution to the UK, fulfilling its net zero policy and transition away from fossil fuels. By reinforcing the electricity transmission network, the Proposed Overhead Line would facilitate the connection of new renewable and low-carbon energy generation and transmission.

5.15.10 In terms of climate change, during the construction phase there is likely to be an increase in daily temperatures and overall rainfall is likely to decrease and lead to more drought risk in Summer. However, winter rainfall is likely to increase, which could cause greater risks of flooding. With the implementation of standard mitigation measures as outlined within **Appendix 4.1 Draft Outline Code of Construction Practice**, the preliminary assessment has concluded that climate change risks during the construction phase have been identified as not significant.

5.15.11 During operation, it is predicted that there will be an increase in average daily temperatures and an average decrease in the amount of rainfall the Proposed Overhead Line's location would receive. With the implementation of standard mitigation measures during construction that would carry through to the operation phase, such as planting and soil management, these measures would inform long term climate controls. As such the preliminary assessment has concluded operational effects would be not significant.

5.15.12 For in-combination climate change effects, the preliminary assessment has concluded that interrelated effects reported in other assessments are not significant, and with the implementation of standard mitigation measures as outlined within **Appendix 4.1 Draft Outline Code of Construction Practice** and wider commitments such as the secondary benefits of Biodiversity Net Gain targets on climate change, the construction and operation effects would therefore be considered not significant.

5.16 Substations

Scope

5.16.1 The proposed substation works boundary for the proposed Birkhill Wood Substation and the proposed High Marnham Substation and their associated works is referred to as the 'proposed substation works'. The potential interaction between the proposed substation works at Birkhill Wood and the High Marnham against environmental receptors is assessed in **Chapter 20 Substations and Associated Works**, in Volume I of the PEIR.

5.16.2 The following section presents a summary of the main environmental receptors, and a range of potential environmental effects associated within the construction, operation and maintenance of the proposed substations.

Study Area

5.16.3 The study areas for the environmental topics considered as part of the proposed substation works at Birkhill Wood and High Marnham range from within the proposed substation works areas and up to 30 km away, depending on the potential receptor being considered. These study areas are summarised in sections 5.3 to section 5.15 of this NTS and detailed further within the PEIR.

Existing Baseline

Proposed Birkhill Wood Substation

5.16.4 The proposed substation works are located in the Holderness National Character Area (NCA 40). The landscape features undulating agricultural land, open views, and scattered ancient woodland blocks. The closest settlements to the proposed substation works are Beverley and Cottingham.

5.16.5 Within 10 km of the proposed substation works are three internationally designated sites: the Humber Estuary Ramsar Site, SPA, and SAC. Within 5 km of the proposed substation works is Burton Bushes SSSI and Beverley Parks LNR. Eight non-statutory designated sites for biodiversity are located within 2 km. The proposed substation works is near ancient semi-natural woodland and priority habitats including deciduous woodland, coastal and floodplain grazing marsh, and traditional orchard.

5.16.6 Within 30 km of the proposed substation works there are four designated sites of international importance. These are, Lower Derwent Valley Ramsar Site, Lower Derwent Valley SPA Humber Estuary Ramsar Site and the Humber Estuary SPA. There are no statutory designated sites for birds of national and local importance and no non-statutory sites of local importance within the study area of the proposed substation works.

5.16.7 There are 17 scheduled monuments, five Conservation Areas and 371 Listed Buildings (five Grade I, 334 Grade II, and 32 Grade II*) located within 3 km of the proposed substation works. The site crosses the historic landscape of NCA 40: Holderness and is approximately 1.8 km to the west to the historic landscape of medieval to post-medieval Risby Hall.

5.16.8 The proposed substation works would be within a surface water Drinking Water Safeguard Zone and Nitrate Vulnerable Zone[8]. The majority of the proposed substation works would be located within Flood Zone 1 (low risk), but the access road to the proposed substation works crosses Flood Zone 3 (high risk).

5.16.9 Geology and Hydrogeology: Superficial deposits of Tilt (Devensian) are present throughout the proposed substation works with a small section in the north and south of consisting of sand and gravel of uncertain age and origin. The bedrock geology comprises the Flamborough Chalk Formation and Burnham Chalk Formation. The study area is located within a Principal Aquifer. The southern half of the proposed substation works are located within SPZ 1 and the northern half within SPZ 2.

[8] Nitrate Vulnerable Zones (NVZs) are areas designated as being at risk from agricultural nitrate pollution.

5.16.10 The agricultural land at the proposed substation works comprises Grade 2 land with a small area of Grade 3 land, indicating the presence of BMV agricultural land within the area of the proposed substation works. The land use across the proposed substation works is arable land.

5.16.11 PRoW within the proposed substation works include footpaths, bridleways the Beverley Footpath (National Trail) 20 and National Cycle Network Route number 1.

5.16.12 Air quality monitoring data shows no exceedances of air quality. There are no Noise Important Areas within the study area and four NSRs within the study area. Ambient sound levels are generally low.

5.16.13 Socio-economic, recreation, and tourism receptors within 500 m of the proposed substation include Bentley Sanctuary Stone tourist attraction and three LWSs (Bentley Moor Wood LWS, Birkhill Wood LWS and Woodhill Path Cottingham LWS).

5.16.14 Health and Wellbeing: The East Riding of Yorkshire has a slightly older population with a lower proportion of working-age people, slightly lower economic activity and income levels, and lower qualification levels, while being less ethnically diverse than regional and national averages. Overall, the area has a relatively healthy population and low levels of deprivation.

5.16.15 Climate Change: The existing land use is mainly arable land, with some trees and woodland. The immediate surroundings include arable land, Dogger Bank Wind Farm Substation, the existing Creyke Beck Substation, and overhead lines.

Proposed High Marnham Substation

5.16.16 The proposed substation works is located within the Trent and Belvoir Vales National Landscape Character Area (NCA 48). The landscape is characterized by flat, low-lying arable farmland with sparse woodland cover.

5.16.17 There are no international or local statutory designated sites for nature conservation within the study area. Spalford Warren SSSI is located 3 km southeast of the proposed substation works. Ten non-statutory designated sites for biodiversity are located within 2 km of the proposed substation works. Priority habitats within 1 km of the proposed substation works include deciduous woodland, coastal and floodplain grazing marsh, traditional orchard, and good quality semi-improved grassland.

5.16.18 There are three scheduled monuments, one Conservation Area and 78 Listed Buildings (four Grade I, 68 Grade II, and six Grade II*) located within 3 km of the proposed substation works. The proposed substation works is located within the historic landscape of NCA 48: Trent and Belvoir Vales.

5.16.19 The proposed substation works are located in Flood Zone 1 and is not located within a surface water Drinking Water Safeguard Zone but is located within an NVZ. The River Trent is located approximately 500 m to the east.

5.16.20 Geology and Hydrogeology: Superficial deposits are limited to small sections of Alluvium and Holme Pierrepont sand and gravel. Bedrock geology is entirely comprised of the Mercia mudstone group. The study area is located within a Secondary B Aquifer, with most of the groundwater classified as High vulnerability. There are two sites including the Former High Marnham Power Station and current Substation, and High Marnham Power Station historic landfill which have potentially contaminative historic land uses.

5.16.21 Agricultural land within the proposed substation works comprises extensive areas of Grade 3 land with a small pocket of Grade 2 land indicating the presence of BMV agricultural land within the area of the proposed substation works. The land use across the proposed substation works is arable land.

5.16.22 Several PRoWs, including the National Cycle Network Route 647, are located within the proposed substation works.

5.16.23 Local authority monitoring data did not show any exceedances of air quality. There are no Noise Important Areas within the study area. The main existing sources of noise include the East Coast Main Line railway and several local roads. Ambient sound levels are likely to be considered typical of rural environments.

5.16.24 Health and Wellbeing: The population in Bassetlaw has a growth rate lower than the national average. The population is predominantly white British with a slightly older demographic compared to national averages. Economic activity rates and income levels are lower than regional and national averages, while deprivation and disability rates are higher.

5.16.25 Socio-economic, recreation, and tourism receptors within 500 m of the proposed substation works include a pub, a holiday park, and five Locally Important Wildlife Sites (Marnham Railway Yard LWS, Fledborough to Harby Dismantled Railway LWS, Fledborough Holme LWS, Skedby Road Triangle LWS and Old Trent, Marnham).

5.16.26 Climate Change: The current land use consists of arable land, with some trees and small woodland areas and is adjacent to existing infrastructure.

Mitigation

5.16.27 National Grid has incorporated mitigation measures into the design of the Project to avoid or reduce significant effects. These include carefully choosing the locations and routes for infrastructure to fit better into the landscape and, where possible, placing new infrastructure to minimise the visual impact and change to landscape character.

5.16.28 **Appendix 4.1 Draft Outline Code of Construction Practice** in Volume 3 of the PEIR outlines the control and management mitigation measures to be implemented during the construction of the Project to help the control and management of effects that could affect visual receptors resulting from the construction of the substations. These include measures such as, retaining vegetation where practicable, protecting retained vegetation in close proximity to working areas and implementing after care plans for planting.

Preliminary Assessment

5.16.29 There are no potential effects on geology and hydrogeology associated with the construction, operation or maintenance of the proposed substation works.

Proposed Birkhill Wood Substation

5.16.30 The potential construction and where applicable the maintenance effects of the proposed substation works at Birkhill Wood include:

- Landscape and Visual: Construction activities, such as vegetation removal and the presence of temporary infrastructure could affect the landscape character and visual amenity.

- Ecology and Ornithology: Construction could result in habitat loss, fragmentation, and disturbance for protected and notable species, including birds. There is potential for incidental mortality of species due to construction and maintenance activities. Noise, vibration, visual disturbances, and lighting could also negatively impact protected species.
- Cultural Heritage: Construction activities have the potential to result in impacts on designated and non-designated heritage assets, including changes to their setting. The construction and limited maintenance activities could also have permanent physical impacts on the historic landscape due to the introduction of trackways for vehicle access.
- Water Environment: Construction has the potential to pollute the water environment receptors due to activities such as soil stripping, earthworks, and the use of machinery. Watercourse crossings and diversions associated with the access road could also cause physical disturbances and changes to flow regimes. Additionally, construction activities might increase surface water runoff and disrupt land drainage, potentially increasing flood risk.
- Agriculture and Soils: Construction would lead to the temporary loss of agricultural land, including some classified as BMV land. Soil function could also be temporarily affected due to soil disturbance.
- Traffic and Transport: Construction has the potential to increase severance to pedestrians, cyclists and user of Public Rights of Way (PRoW). Drivers may be subject to delays at junctions and roads being used by construction traffic.
- Air Quality: Construction activities could elevate dust levels impacting human and ecological receptors. Vehicle emissions and the use of non-road mobile machinery (NRMM) could also contribute to localized increases in air pollutants.
- Noise and Vibration: Construction activities and traffic are expected to generate noise and vibration impacts, potentially affecting nearby NSRs.
- Socio-economics, Recreation, Tourism and Health and Wellbeing: Construction activities would generate employment, training and apprenticeship opportunities. Increased employment in the area would increase money in the local economy. Construction activities might temporarily affect PRoWs, causing severance for users. Potential for amenity impacts on residential properties, Bentley Sanctuary Stone tourist attraction and three LWSs.
- Climate Change: The proposed substation works has the potential to both affect and be affected by climate change during its construction and maintenance, in terms of the greenhouse gas emissions emitted during construction and its contribution to national emissions but also its resilience to projected future climate change.

5.16.31 The potential operational effect of the Proposed Substation Works at Birkhill Wood include:

- Landscape and Visual: Due to its size and the presence of infrastructure like overhead lines has the potential to alter the visual landscape. This could result in a perceived reduction in scenic quality, particularly for those residing in nearby settlements like Beverley and Hull, users of PRoW, and visitors to recreational areas.
- Ecology and Ornithology: Construction could result in habitat loss, fragmentation, and disturbance for protected and notable species, including birds. There is potential

for incidental mortality of species due to construction and maintenance activities. Noise, vibration, visual disturbances, and lighting could also negatively impact protected species.

- Cultural Heritage: The presence of the proposed substation works has the potential to alter the setting of designated heritage assets, such as scheduled monuments and listed buildings. The proposed substation works visual impact could also affect the historic landscape.
- Water Environment: There is the potential for an increase in surface water runoff due to the creation of impermeable surfaces (like the proposed substation works footprint including access roads). This altered drainage pattern could disrupt the existing land drainage regime, leading to localised flooding risks.
- Agriculture and Soils: The footprint of the proposed substation works would result in the permanent loss of agricultural land, including potentially productive BMV land, impacting agricultural activities in the area.
- Traffic and Transport: The permanent diversion of EY | Rowley | Bridleway No.13 would impact equestrian users of this route.
- Air Quality: No impacts are likely during the operation of the proposed substation works on air quality.
- Noise and Vibration: There is the potential for noise impacts associated with the operation of the proposed substation works.
- Socio-economics, Recreation, Tourism and Health and Wellbeing: The operational impacts on socio-economics are likely to be minimal. However, the visual presence of the substation could impact the tourism and recreational experience, particularly for those visiting nearby attractions and natural areas. There would also be the permanent diversion of EY | Rowley | Bridleway No.13 which would impact equestrian users of this route.
- Climate Change: The proposed substation works has the potential to be impacted by future climate change events. The proposed substation works will be designed and constructed recognising the potential for events such as these to occur.

Proposed High Marnham Substation

5.16.32 The potential construction and where applicable the maintenance effects of the Proposed Substation Works at High Marnham include:

- Landscape and Visual: Construction activities may result in changes to character due to vegetation removal, the presence of storage areas and access routes, and the movement of plant, vehicles and staff. There is the potential for the construction activities to views experienced by local residents and recreational users, including those using public rights of way.
- Ecology and Ornithology: During the construction and maintenance of the proposed substation works, there is the potential to result in habitat loss and fragmentation, as well as the disturbance of protected and notable species Incidental mortality of birds may occur during maintenance works.

- Cultural Heritage: The presence of the proposed substation works has the potential to alter the setting of designated heritage assets, such as scheduled monuments and listed buildings. The proposed substation works visual impact could also affect the historic landscape.
- Water Environment: Construction activities have the potential to pollute water environment receptors, including from silt, hydrocarbons, and other construction materials. There is also the potential for changes to water flows. This could lead to increased surface water runoff and flood risk.
- Agriculture and Soils: There is the potential for the loss of agricultural land and BMV agricultural land during construction, resulting in a reduction in productive capacity and potential impacts on associated farming businesses.
- Traffic and Transport: Construction of the proposed substation works would likely lead to increased traffic which could result in a number of effects. These include increased severance for pedestrians, cyclists and horse riders, delays to drivers and other road users, a temporary decline in highway safety, and reduced amenity for non-motorised users.
- Air Quality: Construction activities may affect air quality through dust deposition and vehicle emissions from construction traffic and NRMM.
- Noise and Vibration: Noise and vibration impacts from construction activities and traffic have the potential to impact NSRs within the study area.
- Socio-economics, Recreation, Tourism and Health and Wellbeing: Construction activities would generate employment, training and apprenticeship opportunities. Increased employment in the area has to potential to increase money in the local economy. Construction activities may temporarily affect PRoWs, causing severance for users. Potential for amenity impacts on residential properties, a holiday park, pub and five Locally Important Wildlife Sites.
- Climate Change: The substation works has the potential to both affect and be affected by climate change during its construction and maintenance, in terms of the greenhouse gas emissions emitted during construction and its contribution to national emissions but also its resilience to projected future climate change.

5.16.33 The potential operational effects of the proposed substation works at High Marnham include:

- Landscape and Visual: The operation of the proposed substation works could result in effects on landscape character resulting from the change to landscape elements and features, and the introduction of new infrastructure. Operational effects on visual amenity include the potential for effects on the character of views experienced by residents, recreational users of the PRoW network.
- Ecology and Ornithology: The proposed substation works may result in habitat fragmentation, acting as a barrier to the movement and dispersal of protected and notable species. However new infrastructure, such as gantries, has the potential to create nesting opportunities for certain bird species.
- Cultural Heritage: The operation of the proposed substation works has the potential to result in permanent impacts on designated and non-designated heritage assets, as well as historic landscapes due to changes in their setting.

- Water Environment: The primary concern relating to the operation of the proposed substation works is the potential for increased surface water flood risk from new infrastructure within flood zones. This may lead to increased surface water runoff and could disrupt land drainage.
- Agriculture and Soils: The operation of the proposed substation works will result in the permanent acquisition of land, including BMV agricultural land, leading to a reduction in the most productive agricultural land.
- Traffic and Transport: No traffic and transport effects are predicted during the operation of the proposed substation works.
- Air Quality: No air quality effects are expected to occur during the operation of the proposed substation works.
- Noise and Vibration: There is the potential for noise impacts associated with the operation of the proposed substation works.
- Socio-economics, Recreation, Tourism and Health and Wellbeing: The operational impacts on socio-economics are likely to be minimal. However, the visual presence of the proposed substation works could negatively impact the tourism and recreational experience, particularly for those visiting nearby attractions and natural areas.
- Climate Change: The proposed substation works has the potential to be impacted by future climate change events. The proposed substation works will be designed and constructed recognising the potential for events such as these to occur.

5.17 Cumulative Effects

5.17.1 The potential interaction between the Project and other developments is assessed in **Chapter 21 Cumulative Effects** in Volume I of the PEIR.

Intra-Project Cumulative Effects

5.17.2 Once further information is available on the significance of effects within each assessment, a review will be undertaken to identify whether potentially significant intra-project cumulative effects may arise.

5.17.3 Intra-project cumulative effects can occur where a single receptor is affected by multiple aspects of the Project – for example occupants of a house may be impacted by a combination of visual impacts, noise and changes in air quality, leading to a greater effect on them.

5.17.4 Further information on intra-project cumulative effects will be presented in the Environmental Statement which will be submitted alongside the application for development consent.

Inter-Project Cumulative Effects

5.17.5 A preliminary assessment of inter-project cumulative effects has been undertaken; these can occur where the effects of the Project interact with the effects of other developments to generate a greater effect.

5.17.6 The preliminary assessment is following a staged process:

- Stage 1: Establish a ‘zone of influence’ for each environmental topic within which effects associated with that topic could occur and develop a long list of other developments which could have effect interactions with the Project.
- Stage 2: Develop a shortlist of other developments which could have effect interactions with the Project, using a series of criteria including the size of developments, available environmental information, and their likely timescales.
- Stage 3: Gather information available on the shortlisted developments.
- Stage 4: Assess the likely significant cumulative effects of the shortlisted developments with the Project.

5.17.7 For the statutory consultation, Stages 1 and 2 have been completed and are reported in the PEIR. Stages 3 and 4 will be undertaken and presented in the cumulative effects chapter of the Environmental Statement.

5.17.8 This PEIR presents a preliminary inter–project cumulative assessment. It has not been possible to provide a preliminary intra–project cumulative assessment at this stage. Full inter–project and intra–project cumulative assessments will be presented within the Environmental Statement.

5.17.9 The assessment of inter-project cumulative effects has, at this preliminary stage, been based on professional judgement and using similar project experience.

5.17.10 The preliminary assessment concluded that inter-project cumulative effects are possible for 180 planning applications shortlisted at Stage 2[9], with 67 of these being identified as being taken forward to stage 3.

[9] Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment, https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment

6. Looking Forward

6.1 What Happens Next?

6.1.1 Following the close of the consultation all feedback will be collated and analysed to identify key themes and understand comments, concerns and any requests for changes to the design. National Grid will review its proposals and, where appropriate, refine these in light of feedback.

6.1.2 Based on consultation responses, design refinements and additional information that becomes available from site visits and surveys, the environmental assessment will be reviewed and updated for the Environmental Statement.

6.1.3 National Grid expects to submit its DCO application for the Project in Summer 2026, which will include the Environmental Statement reporting the findings of the EIA process.

6.2 What if I would like further information

6.2.1 This document is a non-technical summary of the PEIR for the proposed North Humber to High Marnham Project. The PEIR Volumes 1, 2, 3 and 4 provide more detailed and technical information which is available on the Project website:

https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/north-humber-to-high-marnham

6.2.2 Further information can also be obtained:

- Via email: contact@nh-hm.nationalgrid.com.
- Telephone: 0800 915 2497 (lines are open Monday to Friday, 9:00am-5:30pm).

6.2.3 Public information events will also take place as follows:

Table 6.2 – Details of the 2025 Statutory Consultation Events

Date and Time	Venue
1st March 2025 11:00 to 16:00 hrs	Dunham on Trent Village Hall NG22 0FJ
3rd March 2025 13:00 to 19:00 hrs	Gringley on the Hill Community Centre DN10 4QY
4th March 2025 13:00 to 19:00 hrs	North and South Wheatley Village Hall DN22 9DL
10th March 2025 13:00 to 19:00 hrs	Crowle Community Hall DN17 4LL

Date and Time	Venue
14th March 2025 13:00 to 19:00 hrs	All Saints Community Centre HU15 2EU
15th March 2025 11:00 to 16:00 hrs	Gilberdyke Memorial Hall HU15 2UB
19th March 2025 13:00 to 19:00 hrs	Garthorpe Village Hall DN17 4AD
21st March 2025 13:00 to 19:00 hrs	Epworth Imperial Hall DN9 1HJ
26th March 2025 13:00 to 19:00 hrs	Cottingham Civic Hall HU16 5QF

6.2.4 In addition to the in-person events as detailed in Table 6.2, six public online webinars will take place over the statutory consultation period. Information on how to sign up to these events can be found on National Grid's website for the Project. The dates for the webinars are as follows:

Table 6.3 – Public Online Webinars

Date and Time	Topic
Tuesday 25 February 2025 18:30 to 19:30 hrs	General – Overview of the proposals
Thursday 6 March 2025 18:30 to 19:30 hrs	Route sections 1, 2 and 3
Tuesday 11 March 2025 18:30 to 19:30 hrs	Route sections 4, 5, 6 and 7
Thursday 13 March 2025 18:30 to 19:30 hrs	Route sections 8 and 9
Tuesday 18 March 2025 18:30 to 19:30 hrs	Route sections 10 and 11
Thursday 27 March 2025 14:00 to 15:00 hrs	General – Overview of the proposals

6.2.5 Printed copies of the consultation materials, including the PEIR, will be made available for viewing at public information events.

6.2.6 In addition to being available at the public information events and online, printed copies of the PEIR NTS will be available at inspection points along the route to view throughout the consultation period. These locations are provided in the Table 6.4 along with a contact email address for each venue.

Table 6.4 – Details of the Inspection Points (2025)

Venue	Address	Point of Contact
Beverley Library	Champney Treasure House, Champney Road, Beverley, HU17 8HE	beverley.library@eastriding.gov.uk
South Cave Library	97 Church Street, South Cave, HU15 2EP	lama.admin@eastriding.gov.uk
Goole Library	Carlisle Street, Goole, DN14 5DS	goole.library@eastriding.gov.uk
Cottingham Library and Customer Services Centre	Market Green, Cottingham, HU16 5QG	csccott@eastriding.gov.uk Helen.Richmond@eastriding.gov.uk
Crowle Library	The Market Hall, Market Place, Crowle, DN17 4LA	library.enquiries@northlincs.gov.uk
Haxey Library	The Memorial Hall, Haxey, DN9 2HH	library.enquiries@northlincs.gov.uk
Misterton Library	High Street, Misterton, DN10 4BU	ask@inspireculture.org.uk
Retford Library	Churchgate, Retford, DN22 6PE	ask@inspireculture.org.uk
Bassetlaw District Council - Retford Office	17B The Square, Retford, Notts, DN22 6DB	customer.services@bassetlaw.gov.uk
Epworth Library	Live Well Isle of Axholme, Burnham Road, Epworth, DN9 1BZ	library.enquiries@northlincs.gov.uk
Gainsborough Library	Cobden Street, Gainsborough, DN21 2NG	Gainsborough.Library@GLL.ORG

Venue	Address	Point of Contact
All Saints Parish Church Misterton	High Street, Misterton, DN10 4AL	https://www.achurchnearyou.com/church/17720/get-in-touch/
Nottinghamshire Mobile Libraries	Mobile North Route 11: Cromwell, Carlton on Trent, Grassthorpe, High Marnham, Normanton, Weston	ask@inspireculture.org.uk

6.3 How Can I Have My Say?

6.3.1 National Grid want to hear your views on the proposals for North Humber for High Marnham. You can get in touch in the following ways:

- Completing the feedback questionnaire online via the Project website: https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/north-humber-to-high-marnham
- Providing feedback by email (contact@nh-hm.nationalgrid.com) or in writing to *FREEPOST NH TO HM*.
- Completing a paper feedback questionnaire, which can be provided on request, at one of the designated inspection points, or completed in person at the face-to-face events. The questionnaire can be returned free-of-charge using the Freepost address: *FREEPOST NH TO HM* (please write this in capitals, you do not need a stamp).

6.3.2 Consultation responses received via any other method than those listed above, such as through social media, may not be formally recorded as part of the consultation.

6.3.3 Responses given orally, such as via telephone or in a meeting, may be considered in exceptional circumstances on a case-by-case basis where someone may not otherwise be able to respond to the consultation.

6.3.4 All responses must be received by 11:59 pm on the final day of consultation.

6.3.5 All feedback will be handled in accordance with all applicable laws concerning the protection of personal data, including the UK General Data Protection Regulation (GDPR).

6.3.6 More information on how National Grid will use the information collected about respondents will be made available in the consultation feedback form and on the Project's website during the consultation period.

6.3.7 National Grid may be required to make copies of representations available to the Secretary of State. However, National Grid will request that personal details are not placed on the public record. Personal details will be held securely in accordance with the relevant data protection legislation and will be used solely in connection with the consultation process and the development of this Project and will not be disclosed to any third parties.

Figures

Non-Technical Summary Plans

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