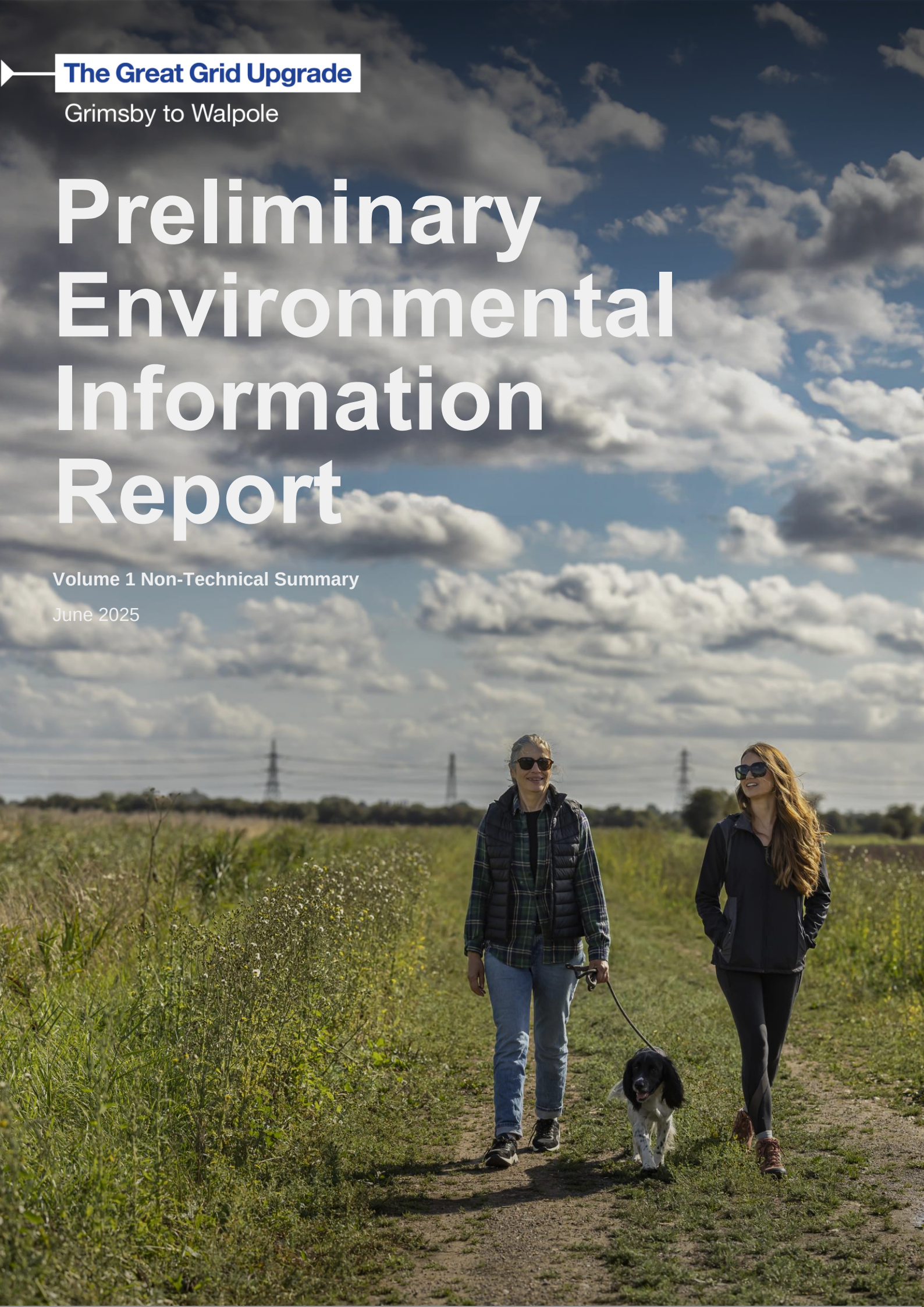
The Great Grid Upgrade

Grimsby to Walpole

Preliminary Environmental Information Report

Volume 1 Non-Technical Summary

June 2025



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1. Introduction

1.1 Overview

1.1.1 Grimsby to Walpole (the Project) is a project proposed by National Grid Electricity Transmission plc (National Grid) to reinforce the high voltage power network in several regions across the East of England. It comprises approximately 140 kilometres (km) of new overhead transmission line and up to six new 400 kilovolt (kV) substations.

1.1.2 The Project is defined as a 'Nationally Significant Infrastructure Project' (NSIP). 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 Information (PEI) Report has been prepared as part of the Stage 2 consultation. It presents the preliminary findings of the environmental assessments done to date. The purpose of the PEI Report is to allow members of the public, consultation bodies and other stakeholders to develop an informed view of the preliminary likely significant environmental effects of the Project, allowing them to provide feedback through the consultation process (see section 4.2). Feedback received through this process will inform the ongoing development of the design of the Project, including any additional measures which may be required to address environmental effects.

1.1.4 The findings of the full Environmental Impact Assessment (EIA) will be presented in a document called an Environmental Statement (ES) which will accompany the DCO application.

1.1.5 This Non-Technical Summary (NTS) presents a summary of the information set out in more detail in the PEI Report for the Project. The aim of this NTS is to enable local communities and stakeholders to understand the likely significant environmental effects that could arise from the Project, as reported in the PEI Report, in a concise manner.

1.2 Structure of this Non-Technical Summary

1.2.1 This NTS includes an outline of the main alternatives considered to date, a description of the Project, the methodology and approach to the PEI Report, a summary of the preliminary environmental assessment done to date (split by environmental topic, with a summary per route Section followed by a route-wide summary), and next steps. **Table 1.1** sets out further details on the sections of this NTS.

Table 1.1 Structure of this NTS

Section of NTS	What is it about?
1. Introduction	This section presents an introduction to National Grid, what the Project entails, why it is needed and where it is located.
2. Main Alternatives Considered	This section explains the key alternative designs that have been considered to date and provides a summary of how the design has developed to the current stage.
3. Project Description	This section presents the Project in more detail, what new electricity infrastructure would be implemented and how long construction would take.
4. Approach and Methodology	This section explains the approach to the PEI Report and how the preliminary assessments have been undertaken. It also provides an overview of the consultation and stakeholder engagement carried out to inform the development of the Project to date.
5. Preliminary Summary of Environmental Effects	This section presents a summary of the findings of the preliminary environmental assessments for each environmental topic. It provides the key potential environmental effects arising from the Project that have been identified to date.
6. Next Steps	This section explains what happens next in the EIA process and how you can provide feedback to National Grid on the Stage 2 consultation material.

1.3 What is Grimsby to Walpole?

1.3.1 Grimsby to Walpole is a proposed development to reinforce the high voltage electricity power line network between Grimsby in North Lincolnshire and Walpole in Norfolk. It comprises approximately 140 km of new overhead power lines and up to six new 400 kV substations along the route.

1.4 Who is National Grid?

1.4.1 National Grid delivers electricity safely, reliably and efficiently to the customers and communities it serves. 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.

1.4.2 National Grid Electricity Transmission is the part of National Grid applying for development consent for the Project and owns the high voltage electricity transmission system in England and Wales which transports electricity from generators (such as power stations and wind farms) to local distribution network operators (DNOs). DNOs are the companies that own and operate the local power lines and infrastructure that delivers electricity to individual properties. National Grid's transmission network does not connect directly to homes and businesses, because the voltage at which it transmits electricity is too high for domestic and commercial properties.

1.5 Why is Grimsby to Walpole Needed?

1.5.1 As the UK moves to cleaner, more affordable and more secure sources of energy, such as offshore wind, our infrastructure needs to be upgraded to connect this power to the homes and businesses that need it.

1.5.2 The existing transmission network was mostly built in the 1960s, to connect inland coal-fired power stations. Later, gas-fired power stations were connected in areas such as the Humber. However, the Lincolnshire coastal region currently has limited transmission infrastructure, restricting its ability to support new renewable energy connections.

1.5.3 Electricity generators such as solar and offshore wind farms apply to the National Energy System Operator (NESO) to connect to the electricity network. Once a connection is contractually secured, National Grid must provide the connection to the network, whilst also making sure the transmission system meets the performance and security standards outlined in NESO's Security and Quality of Supply Standard. For example, the network must be designed to handle existing and new connections in peak demand conditions and to have sufficient spare capacity to prevent widespread supply interruptions when there are certain faults on the network.

1.5.4 To understand current and future demands on the electricity network, the concept of network boundaries is used. A boundary splits the system into sections and shows where there are high power flows between parts of the network. When flows across a network boundary are higher than what the network can transport whilst meeting standards, National Grid must reinforce the network.

1.5.5 In the case of the Project, we must build new parts of the network to connect new generation and resolve capacity issues across network boundaries known as B8 and B9, which generally represent power flows between the North of England and the Midland, and the Midlands and the South of England and East Anglia.

1.5.6 When looking at new electricity generation in the area, there are two clusters of new connections that are most relevant. The first is the Creyke Beck generation group. This includes connections to existing substations and contracted new generation comprising offshore wind, interconnectors, energy storage, and combined cycle gas turbine (CCGT) power stations.

1.5.7 The second is the East Coast generation group. This area has new contracted generation including offshore wind, energy storage, solar, and CCGTs.

1.5.8 Both generation groups require extra capacity in the electricity network to connect new generation and meet NESO's Security and Quality of Supply Standard.

1.5.9 Grimsby to Walpole is also needed to provide reinforcement across boundaries B8 and B9, which both need additional capacity by 2035 and 2030 respectively, in accommodating the two generation groups as well as wider increases in the volume of power flowing between the North and South of England.

1.5.10 To fix these deficits, B8 needs two 400 kV alternating current (AC) double circuits or six high voltage direct current (HVDC) connections, and B9 needs one 400 kV AC double circuit or three HVDC connections.

1.5.11 Upgrades to the existing network alone will not provide sufficient reinforcement, so additional reinforcements with new infrastructure are essential.

1.5.12 Grimsby to Walpole will add one of the needed network reinforcements with new overhead line and substation infrastructure to connect new offshore wind, energy storage, solar, interconnectors and CCGT that are contracted to connect to homes and businesses.

1.6 The Consenting Process for the Project

1.6.1 As the Project is classified as an NSIP, National Grid need to obtain development consent under statutory procedures set by 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, instead of applying to local authorities for planning permission, National Grid must apply to the Planning Inspectorate, the government body responsible for operating the planning process for NSIPs, for a DCO.

1.6.2 When the DCO application is submitted to the Planning Inspectorate, they will first decide whether to accept the application for Examination. If accepted, the Planning Inspectorate will appoint an independent Inspector or panel of Inspectors (known as the Examining Authority) to examine the 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 The DCO application for the Project is expected to be submitted in summer 2027.

Environmental Impact Assessment

1.6.5 The Project is classified as an EIA development under the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (described throughout this document as ‘the EIA Regulations 2017’). Therefore, National Grid is required to undertake an EIA for the Project.

1.6.6 There are three key documents produced at different stages of the EIA process:

i. EIA Scoping Report: this is prepared early in the EIA process. Its purpose is to define and agree the scope of the EIA including the environmental aspects (or topics) to be addressed as part of the EIA;

ii. Preliminary Environmental Information Report: this is prepared as part of Stage 2 consultation. Its purpose is to provide preliminary details of the environmental assessment done to date and report on the anticipated likely significant effects on the environment as a result of the Project; and

iii. ES: this forms part of the submitted DCO application. It reports on the likely significant environmental effects occurring as a result of the Project and any mitigation measures which are required. It enables consultees and decision-makers to understand the environmental effects of the Project.

1.6.7 The EIA Scoping Report for the Project was submitted to the Planning Inspectorate in August 2024. The Planning Inspectorate provided National Grid with a formal opinion (a Scoping Opinion) on what should be considered within the EIA in September 2024. The Scoping Opinion was also informed by comments from stakeholders.

1.6.8 The PEI Report has been prepared for Stage 2 consultation to set out the preliminary environmental information and findings from the assessments undertaken to date. The PEI Report allows consultees to develop an informed view of the preliminary likely significant environmental effects of the Project and provide any comments on the preliminary findings during the 2025 Stage 2 consultation process. These comments will help inform the ongoing development of the Project and the EIA process before the application is made to the Secretary of State.

1.6.9 Following Stage 2 consultation, the ES will be prepared and this will accompany the application for a DCO.

2. Main Alternatives Considered

2.1 Introduction

2.1.1 This section of the NTS provides a summary of the development of the Project and the main alternatives considered. Further information is contained in the **Strategic Options Report**[1] (SOR) (and the **Grimsby to Walpole – Addendum to Strategic Options Report 2024**[2], and **Strategic Options Report Update**[3]), **Corridor and Preliminary Routing and Siting Study (CPRSS)** [4], **PEI Report** and **Design Development Report**.[5]

2.1.2 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 stated purpose. This is also known as its 'Needs Case', and may include consideration of different locations, technologies or designs.

2.1.3 Options appraisal is a robust and transparent process that is used to compare options and to assess the positive and negative effects. Options are appraised across a wide range of criteria including environmental, socio-economics, technical and cost factors, as set out in National Grid's 'Our Approach to Consenting' (National Grid, 2022)[6]. The goal 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.

2.1.4 **Image 2.1** shows where the options appraisal sits within National Grid's approach to project development and delivery (see National Grid's 'Our Approach to Consenting', National Grid, 2022).

2.1.5 The current design of the Project (presented at the 2025 Stage 2 consultation) is the result of an iterative process that commenced at the inception of the Project, when the initial need to reinforce the electricity network in the East of England was identified. Consideration of environmental, engineering and economic factors has influenced the option identification and selection and the design evolution process. There have also been extensive discussions with relevant stakeholders during the development of the Project.

[1] National Grid (2023). Strategic Options Report [online]. Available at: https://www.nationalgrid.com/electricity-transmission/document/152606/download

[2] National Grid (2024). Grimsby to Walpole Addendum to the Strategic Options Report. Available at: https://www.nationalgrid.com/electricity-transmission/document/152611/download

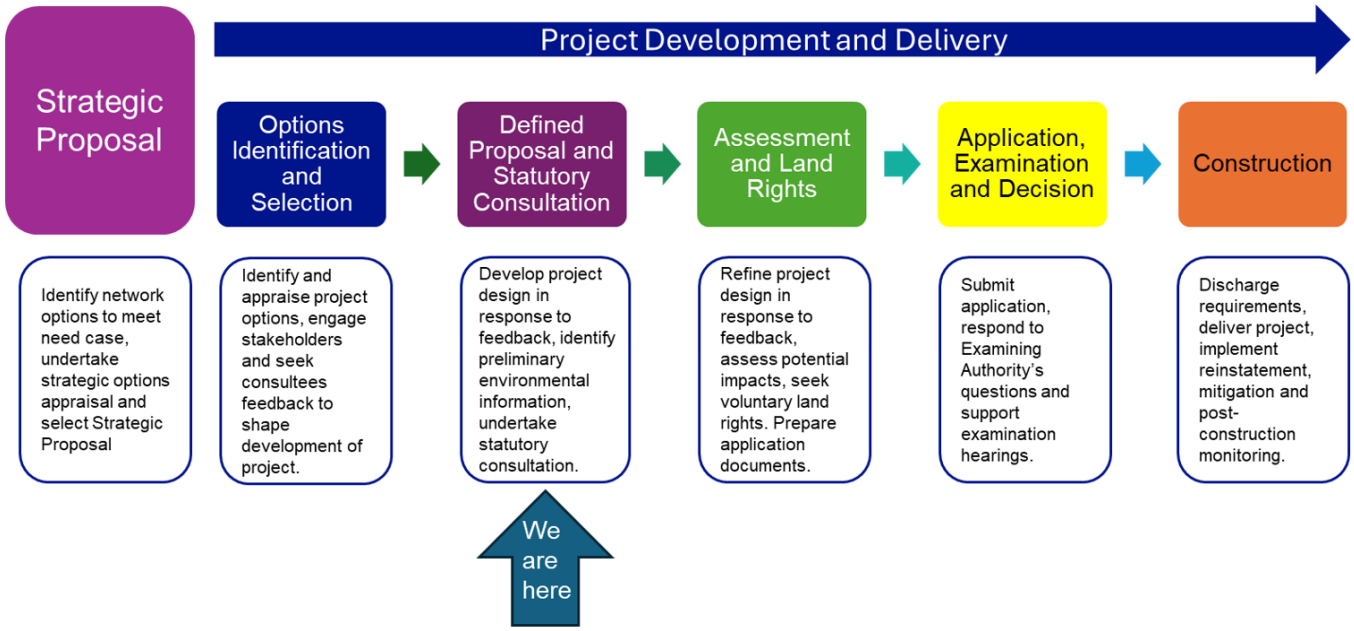
[3] National Grid (2025). Strategic Options Report Update. North Humber to High Marnham and Grimsby to Walpole.

[4] National Grid (2024). Grimsby to Walpole Corridor Preliminary Routeing and Siting Study [online]. https://www.nationalgrid.com/electricitytransmission/document/152621/download.

[5] National Grid (2025). Grimsby to Walpole Design Development Report.

[6] National Grid's 'Our Approach to Consenting' https://www.nationalgrid.com/electricity-transmission/document/142336/download

Image 2.1 National Grid's approach to consenting process



2.2 Strategic Proposal

2.2.1 Following the needs case being identified, National Grid commenced their optioneering process to determine how to best achieve the objectives of reinforcing the high voltage power network in East 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 There were numerous strategic options considered, including a range of different technologies, offshore and onshore options as well as alternative connection points. The strategic options that were capable of meeting the need case were appraised and evaluated across a range of environmental, socio-economic, technical, and cost factors.

2.2.3 Following the appraisal, a primarily overhead line connection between a new Grimsby West Substation to a new substation at Walpole via new Lincolnshire Connection Substation(s) (LCS) emerged as the preference. Further work, reported in an **Addendum to the SOR**, determined that a new substation at Weston Marsh was also necessary. Further work was also undertaken to consider potential electrical configuration options in the Walpole area, including looking at options for use of the existing Walpole Substation. For more details, see the **Strategic Options Report Update**.

2.2.4 Offshore options were found to be substantially more expensive than onshore options, resulting in onshore infrastructure being preferred. The assessment of onshore options considered overhead line routes, however, costs were also presented in the SOR for equivalent underground cable routes. The significant additional costs of undergrounding the full length of the options resulted in overhead lines being the preferred technology, however, this did not rule out consideration of localised undergrounding.

2.2.5 Further detail regarding how the Strategic Proposal was selected is outlined in previous reports, including the **Strategic Options Report Update**.

2.3 Options Identification and Selection

2.3.1 Following selection of the Strategic Proposal, National Grid undertook a further study to define the location of the Project infrastructure, the CPRSS . This process identified and assessed preliminary route corridors, siting zones and siting areas[7], and concluded with the identification of an emerging preferred corridor, preferred siting zones and siting areas, forming an end-to-end solution.

2.3.2 Once the corridors, siting zones and siting areas had been identified, an appraisal process was undertaken on the options which considered environmental, socio-economic, technical and cost factors. Options were discounted owing to poor performing cost benefit analysis, the presence of complex environmental constraints and options being more technically complex to construct.

2.3.3 Key considerations informing the development and selection of options included using or adapting existing infrastructure, prioritising shorter routes, avoidance or minimisation of impacts to environmental or socio-economic features, and finding more cost-effective options.

2.3.4 The routeing and siting stage resulted in an emerging preferred corridor, graduated swathe and a siting zone for the new substations[8] (Grimsby West, LCS A and B, Weston Marsh and Walpole). The CPRSS presents further details on the routeing and siting stage of the Project.

2.3.5 This corridor was consulted on as part of the Stage 1 Consultation in 2024, and the feedback from stakeholders (including the local community) was considered and taken into account to help shape and guide the development of the Project.

Review of the Preferred Route Corridor

2.3.6 Following Stage 1 consultation feedback, there was a review of a section of the emerging preferred route corridor adjacent to the Lincolnshire Wolds National Landscape (Area of Outstanding Natural Beauty). Two options, a ‘western option’ (the preferred corridor from the CPRSS) and an alternative ‘eastern option’ were considered. These corridors comprise sections extending from just south of North Thoresby and Tetney to just north of Burgh le Marsh. The two options were reviewed in further detail, considering any new information that was available since the initial appraisal, for example from further environmental baseline studies or feedback from consultation. It was concluded that the new information does not significantly alter the previous conclusions reported in the CPRSS and therefore the western option remains as the preferred corridor.

2.4 Consideration of Alternatives and Design Development

2.4.1 Following Stage 1 consultation, two core activities have informed the ongoing development of design. These are the review of feedback from the Stage 1 consultation and findings from ongoing environmental and other technical studies.

[7] A siting area is an area which has the capacity to accommodate the siting of a single substation. A siting zone is an area which has the capacity to accommodate multiple siting areas.

[8] Note – at CPRSS Stage, only five substations were required. As the Project has been developed, there is the potential for up to six substations to be required, with up to two now being potentially required at Weston Marsh.

Through these activities, alternatives have been identified and appraised and the Project design has evolved to the proposed design.

2.4.2 All feedback provided was considered and taken into account in the context of environmental and socio-economics constraints and opportunities, engineering feasibility and cost, and planning policy considerations. For example, alternative approaches to the design of parts of the overhead line were assessed throughout the Project, including routeing of the overhead line, siting of pylons and selection of pylon types. Options were assessed against the current design, considering socioeconomic, environmental and technical factors and were then either incorporated into the design or discounted. Alternative locations and designs of the new substations within Sections 1, 3, and 7 were also considered through the process. Detail on these alternatives and the eventual preferred options can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered.**

2.4.3 Feedback from the Stage 1 Consultation, ongoing environmental and technical assessments and surveys have been used to further refine the design of the Project and to develop the draft Order Limits[9] (presented at 2025 Stage 2 consultation). Design refinements explored included the use of low height pylons in locations of high potential visual sensitivity, onshore and offshore options for cable routes, localised undergrounding and careful consideration of the proposed location of new substations and compounds.

2.4.4 The draft Order Limits include a proposed overhead line alignment (with pylon numbers and locations), new substation layouts and locations, construction compounds, third party utilities diversion works, access roads, drainage, environmental mitigation areas, and all temporary works associated with construction and operation (and maintenance) of the Project, all of which are indicative.

2.4.5 Further information on the development and refinement of the Project design, including detail on alternative overhead line routes and new substation locations can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the Design Development Report.

[9] Draft Order Limits define the boundary of the entire area within which a project could take place, including both temporary and permanent works, as well as works to existing infrastructure.

3. Project Description

3.1 Key Components of Grimsby to Walpole

3.1.1 Current proposals for the Project, which are subject of the 2025 Stage 2 consultation, comprise:

i. Approximately 140 km of new 400 kV overhead transmission line (see **Image 3.1** for a typical transmission connection);

ii. A new 400 kV substation to be built in the vicinity of the existing Grimsby West 400 kV Substation in North East Lincolnshire (to be referred to as the new Grimsby West Substation). The existing substation would be partly or fully decommissioned. The extent of decommissioning will be determined and reported in the ES;

iii. Two new 400 kV Lincolnshire Connection substations located south-west of Mablethorpe in East Lindsey (to be referred to as Lincolnshire Connection Substation A and Lincolnshire Connection Substation B);

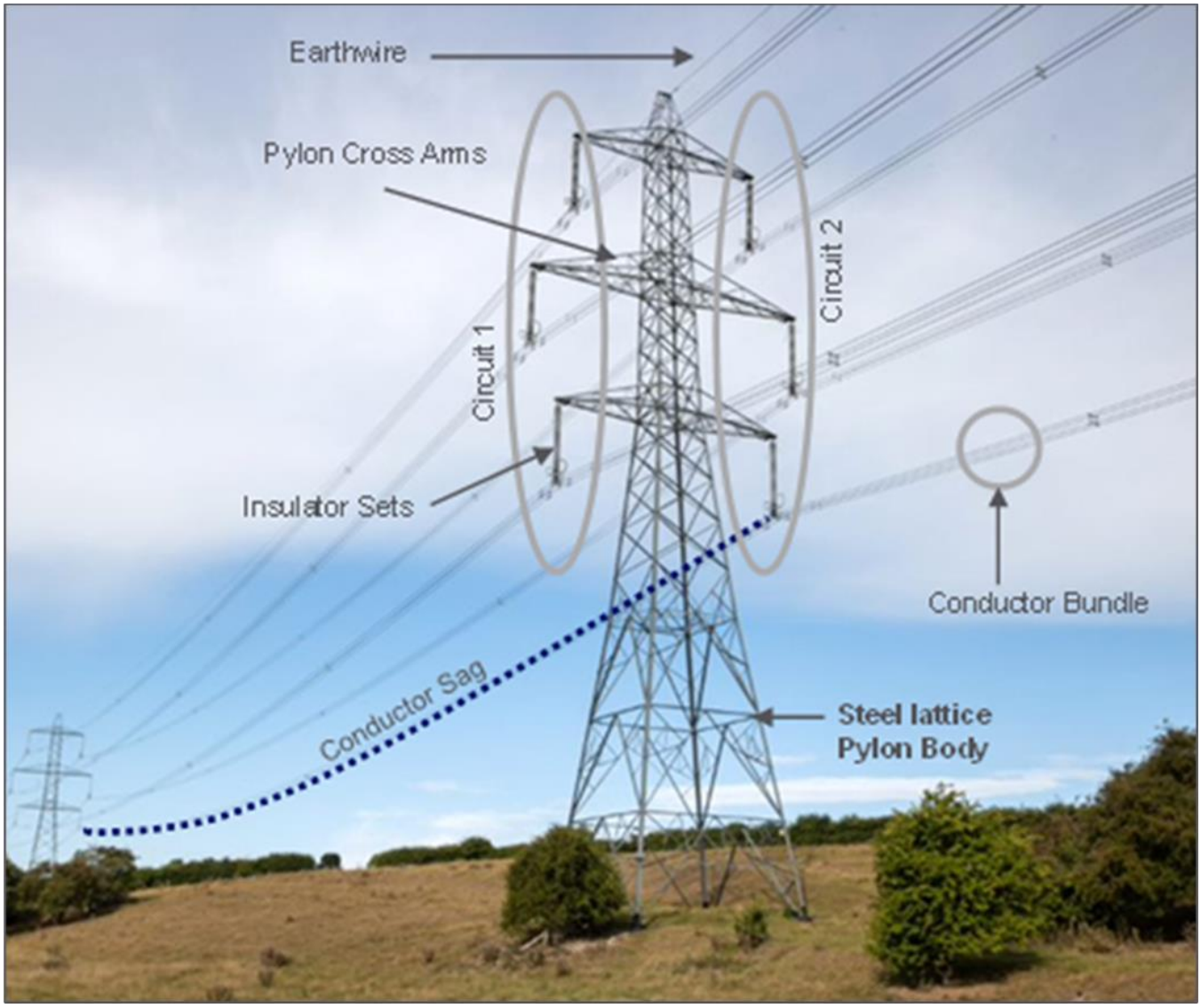
iv. Up to two new 400 kV substations in the vicinity of the Spalding Tee-Point in South Holland District (to be referred to as Weston Marsh Substation A and Weston Marsh Substation B);

v. A new 400 kV substation in proximity to the existing Walpole Substation west of the village of Walpole St Andrew and north of the town of Wisbech, in King's Lynn and West Norfolk District (to be referred to as "Walpole B Substation");

vi. Replacement of short sections of existing 400 kV overhead line and local changes to the lower voltage distribution networks to facilitate the construction of the new overhead line and substations.

3.1.2 The Project would also include other works, such as temporary diversions for works on existing overhead power lines, temporary access roads, highway works, temporary works compounds and working areas. The Project would also include utility diversions and drainage works. There would also be land required to deliver environmental mitigation, compensation and enhancement, including Biodiversity Net Gain (BNG).

Image 3.1 Components of a typical transmission connection



3.1.3 The Project also directly interacts with a number of other National Grid projects, including Eastern Green Link (EGL) 3 and EGL 4, which are two new primarily offshore electricity links with associated onshore infrastructure between Scotland and England. The new Walpole B substation is a common connection point for these projects and hence Walpole B Substation forms part of the design for each of these projects and consent for the Walpole B Substation will be sought in both the EGL 3 and EGL 4 DCO and the Grimsby to Walpole DCO.

3.1.4 Other National Grid projects that interact with Grimsby to Walpole include EGL 5, a new primarily offshore electricity link (with associated onshore infrastructure) between Scotland and England, and Weston Marsh to East Leicestershire, which is a new onshore network reinforcement.

3.1.5 Further details are included in **PEI Report Volume 2 Part A Chapter 5 Project Description.**

3.1.6 The project has been broken down into seven route sections (referred to throughout the PEI Report). These Sections comprise:

i. Section 1: New Grimsby West Substation;

ii. Section 2: New Grimsby West Substation to New Lincolnshire Connection Substation A;

iii. Section 3: New Lincolnshire Connection Substations A and B;

iv. Section 4: New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone;

v. Section 5: Refined Weston Marsh Substation Siting Zone;

vi. Section 6: Refined Weston Marsh Substation Siting Zone to New Walpole B Substation; and

vii. Section 7: New Walpole B Substation.

3.1.7 Since the Stage 1 Consultation, there have been changes to the connections required at Weston Marsh as well as identification of additional network reinforcements in the area. Therefore, the detail on the design of Section 5 is less than that of other Sections. Further design work is being undertaken including consideration of whether there is a need for up to two new substations. Further targeted Stage 2 consultation on Section 5 will be undertaken at a future date.

3.1.8 The majority of the Project is located in the East Midlands Region, with part of the Project to the north in Yorkshire and Humber and part to the south in Norfolk, as illustrated in Figure 1: Environmental Constraints Plan. The Project lies within six local planning authority areas, these are:

i. North East Lincolnshire Council;

ii. East Lindsey District Council;

iii. Boston Borough Council;

iv. South Holland District Council;

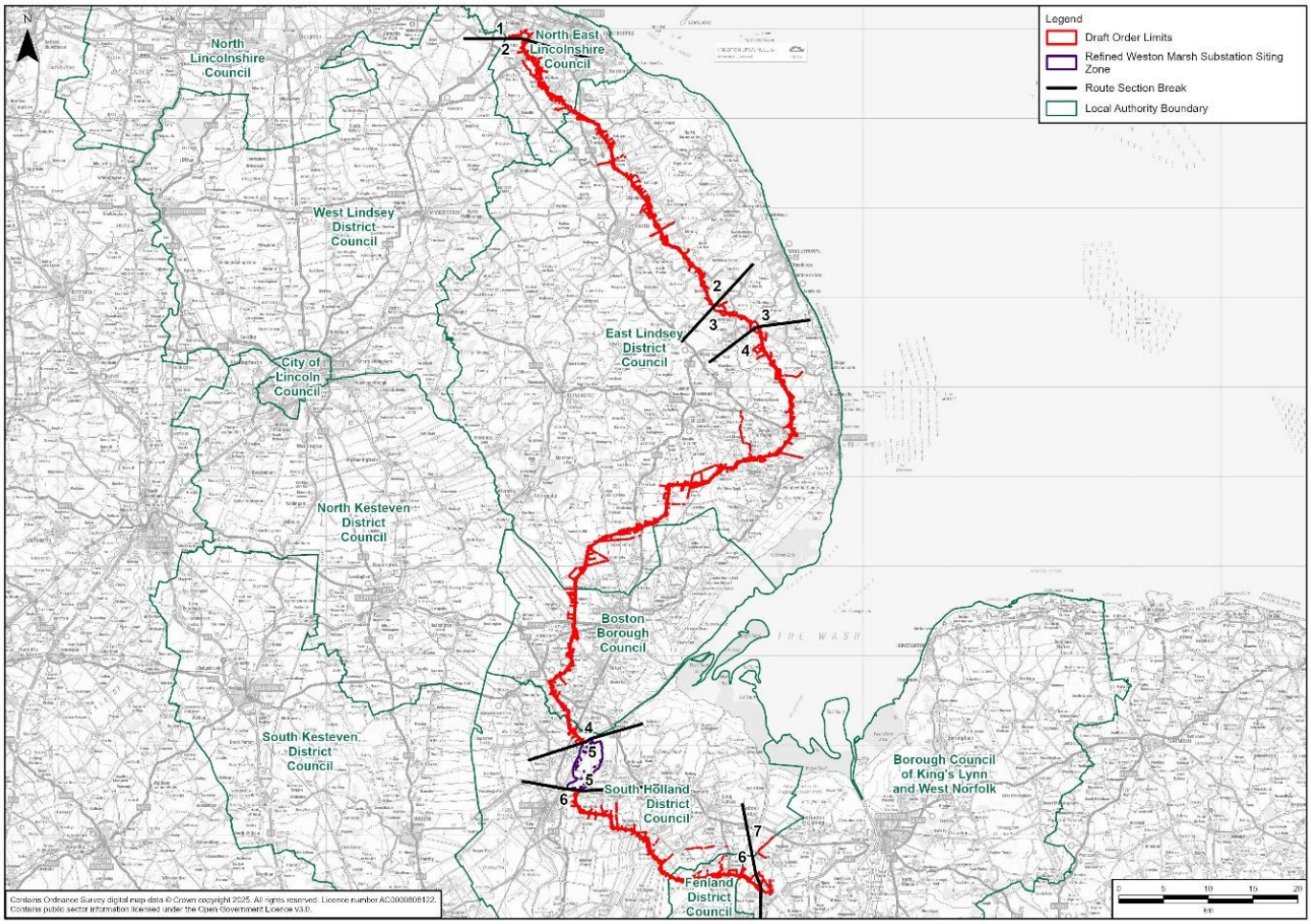
v. Fenland District Council; and

vi. Borough Council of Kings Lynn and West Norfolk.

3.1.9 The Project is located in an area that is predominantly rural, with large parts of the land under arable farming use. Towns that are located within 5 km of the Project include Grimsby, Louth, Boston, Spalding, Wisbech, Skegness, Spilsby and Alford. There are also multiple villages and individual properties near to the Project.

3.1.10 **Image 3.2** provides an overview of the draft Order Limits and the geography of the Project.

Image 3.2 Overview draft Order Limits

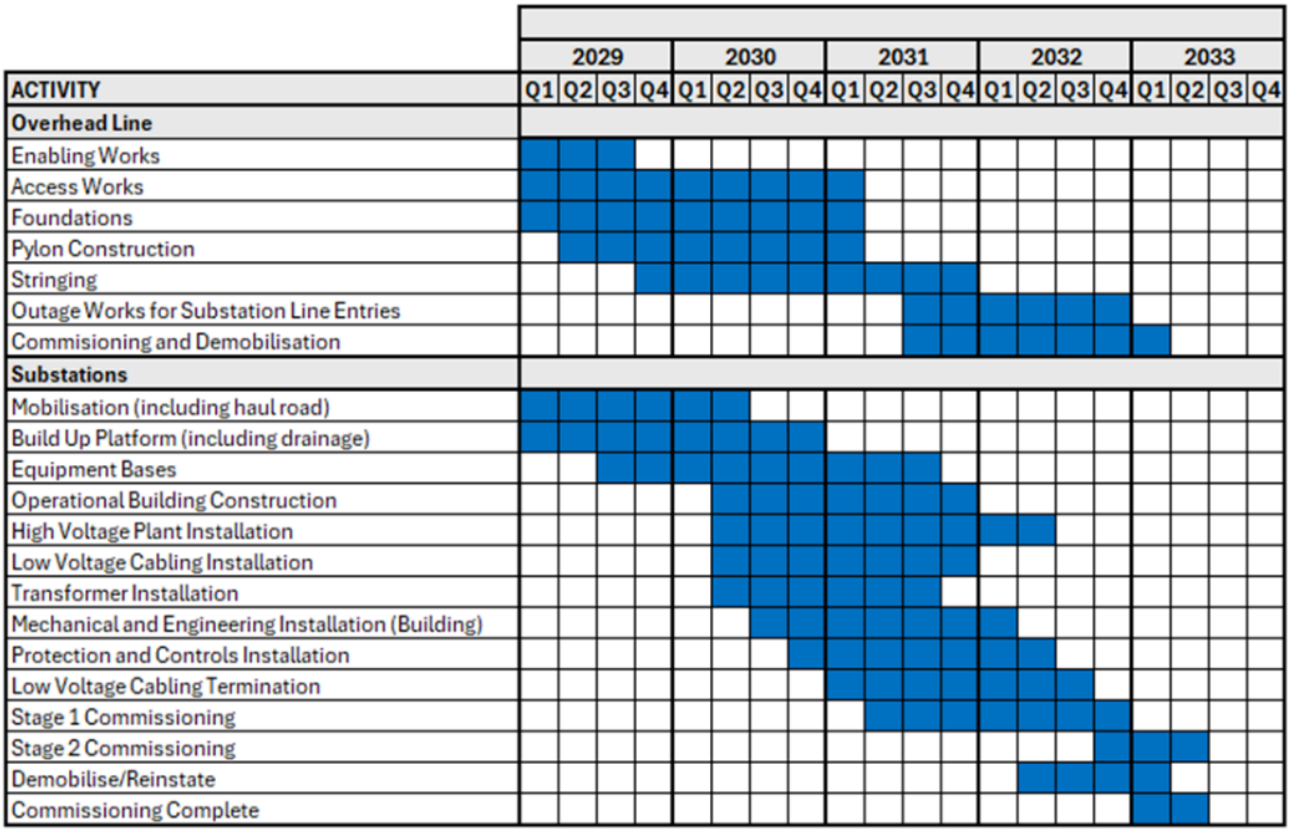


3.2 Construction Programme and Timings

3.2.1 Subject to gaining development consent in 2028, it is anticipated that access and construction of the Project would commence in 2029, starting with enabling works including site clearance activities, the installation of construction compounds and access roads. It is expected the main construction works (construction of new substations and overhead line) would continue through to 2033 (four years). Reinstatement would be required following the construction period of up to two years.

3.2.2 Further details on the phasing of the Project programme will be set out in the ES. An indicative construction programme for the Project is presented in **Image 3.3**.

Image 3.3 Indicative construction programme



Construction Working Hours

3.2.3 The proposed core construction working hours are:

i. Monday to Friday 07:00 – 19:00; and

ii. Saturdays, Sundays, Bank Holidays and other Public Holidays 08:00 – 17:00.

3.2.4 The core construction working hours would exclude start up and close down activities which would take up to one hour before or after the core construction working hours.

3.2.5 It may be necessary to complete works outside of the above hours on occasion for reasons of safety or operational necessity. Further details are provided in **PEI Report Volume 2 Part A Chapter 5 Project Description**.

4. Approach and Methodology

4.1 What is the PEI Report and EIA?

4.1.1 The PEI Report presents a preliminary assessment of the likely significant environmental effects of the Grimsby to Walpole Project, to inform consultation.

4.1.2 The purpose of the PEI Report 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 7 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.

4.1.3 The PEI Report 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.

4.1.4 The full findings of the EIA process will be presented in an ES that will be submitted as part of the application for development consent. The ES provides the public and relevant organisations (such as the Environment Agency (EA), Natural England and Historic England) with the environmental information needed to understand and comment on a development and provides decision-makers with the environmental information to allow a decision to be made whether to grant consent for the development.

4.1.5 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.

4.2 Scoping, Consultation and Engagement

4.2.1 National Grid is committed to engaging and consulting with communities and stakeholders at an early stage of the Project, giving people the opportunity to provide feedback and insight at a formative stage ahead of more detailed design work being carried out.

Early Engagement

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

4.2.3 A Scoping Report was submitted to the Planning Inspectorate in August 2024. The Scoping Report identified the potentially significant effects requiring assessment, determined the subject matter of the assessment and the methodologies for undertaking the assessment. The Planning Inspectorate subsequently provided a Scoping Opinion, which included comments from a range of stakeholders, on behalf of the Secretary of State, in September 2024.

4.2.4 The Scoping Opinion and the consultee responses have subsequently informed the preliminary assessment work and further design evolution to date. Responses to the comments received from the Planning Inspectorate in the Scoping Opinion together with agreement on what has been scoped out of the assessment is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.

Non-Statutory (Stage 1) Consultation

4.2.5 The PEI Report has been informed by the Stage 1 consultation undertaken by National Grid in 2024. Feedback received in 2024 is detailed within the **Grimsby to Walpole Stage 1 Consultation Feedback Report** which is provided alongside the PEI Report.

4.2.6 At the Stage 1 consultation National Grid sought to identify and understand the views and opinions of stakeholders and communities who may potentially be affected by the Project. National Grid engaged with key stakeholders at a non-statutory stage to provide information about the early development of the Project. These stakeholders included statutory bodies, local authorities, elected representatives, local residents, underrepresented groups, and local interest groups.

4.2.7 Following the conclusion of the consultation, feedback was analysed and, along with further technical studies and design work, the Project design was further developed ahead of Stage 2 consultation in 2025.

4.3 PEI Report Approach and Methodology

4.3.1 EIA is a process for identifying the likely significant environmental effects (positive and negative) of a proposed development to inform the decision-making process for DCOs.

4.3.2 The EIA considers all relevant topics that may be impacted, such as Landscape, Historic Environment etc. The topics to be included or excluded (or ‘scoped out’) in the EIA were agreed with the Planning Inspectorate and other stakeholders through the scoping process, with the Planning Inspectorate providing a Scoping Opinion. The Scoping Opinion states the information that the Planning Inspectorate requires to be included (and agreed can be excluded) within an ES.

4.3.3 The PEI Report presents the preliminary EIA findings which are based on the information available at this stage of the process and the Project. The structure of the PEI Report is described in section 4.5 of this NTS.

4.3.4 A detailed description of the existing ‘baseline’ and where relevant ‘future baseline’ has been produced for the draft Order Limits, and where appropriate the area around the draft Order Limits, through a combination of desk-based studies, engagement and consultation and site-specific surveys.

4.3.5 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 (also known as 'standard mitigation') included within a Preliminary Code of Construction Practice (CoCP), and other measures that are added to the design purely to mitigate an effect (also known as 'additional mitigation').

4.3.6 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.

4.3.7 Following the identification of mitigation all preliminary '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 EIA specialists including 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 aspect is provided in each environmental topic chapter of the PEI Report.

4.3.8 All preliminary residual 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.

4.3.9 EIA also requires the consideration of potential cumulative effects:

i. 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.

ii. 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 (Institute of Environmental Management and Assessment, 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.

4.3.10 At this stage a screening exercise has been undertaken to identify the planned developments or other development within the area around the Project which have the potential to result in inter-project cumulative effects. A pre-screening exercise of intra-project effects is presented in the PEI Report in the form of a matrix showing how impacts on receptor groups may interact between topics.

4.4 Mitigation

4.4.1 Environmental assessment has been an integral part of the Project design process since conception, which has meant that the Project has sought to avoid environmentally sensitive features as far as reasonably possible.

4.4.2 National Grid has also embedded mitigation measures into the design of the Project to avoid or reduce significant effects that may otherwise be experienced during construction and operation of the Project.

4.4.3 Three types of mitigation have been assumed to be incorporated into the Project and the preliminary assessment. These are as follows:

i. design mitigation measures: measures that are built into the design of the Project (e.g. locating works away from sensitive sites);

ii. control and management mitigation measures: measures and management activities that would be implemented during the construction of the Project (e.g. good site practice); and

iii. additional mitigation measures: measures over and above design or control measures which are required to further reduce effects (e.g. planting of woodland).

4.4.4 Environmental mitigation measures have been identified within each environmental topic chapter and where relevant to construction are presented in the Preliminary CoCP, which accompanies the PEI Report.

4.5 PEI Report Structure

4.5.1 The PEI Report consists of three volumes containing chapters, appendices and figures. These are:

i. Volume 1: Non-Technical Summary

ii. Volume 2 (Main Report):

- Part A: Introduction and overview of the PEI Report, as well as the supporting figures;
- Part B: preliminary environmental assessment for the seven route Sections, as well as the supporting figures; and
- Part C: route-wide assessments for some of the environmental topics, as well as the supporting figures.

iii. Volume 3: technical appendices in support of PEI Report Volume 2.

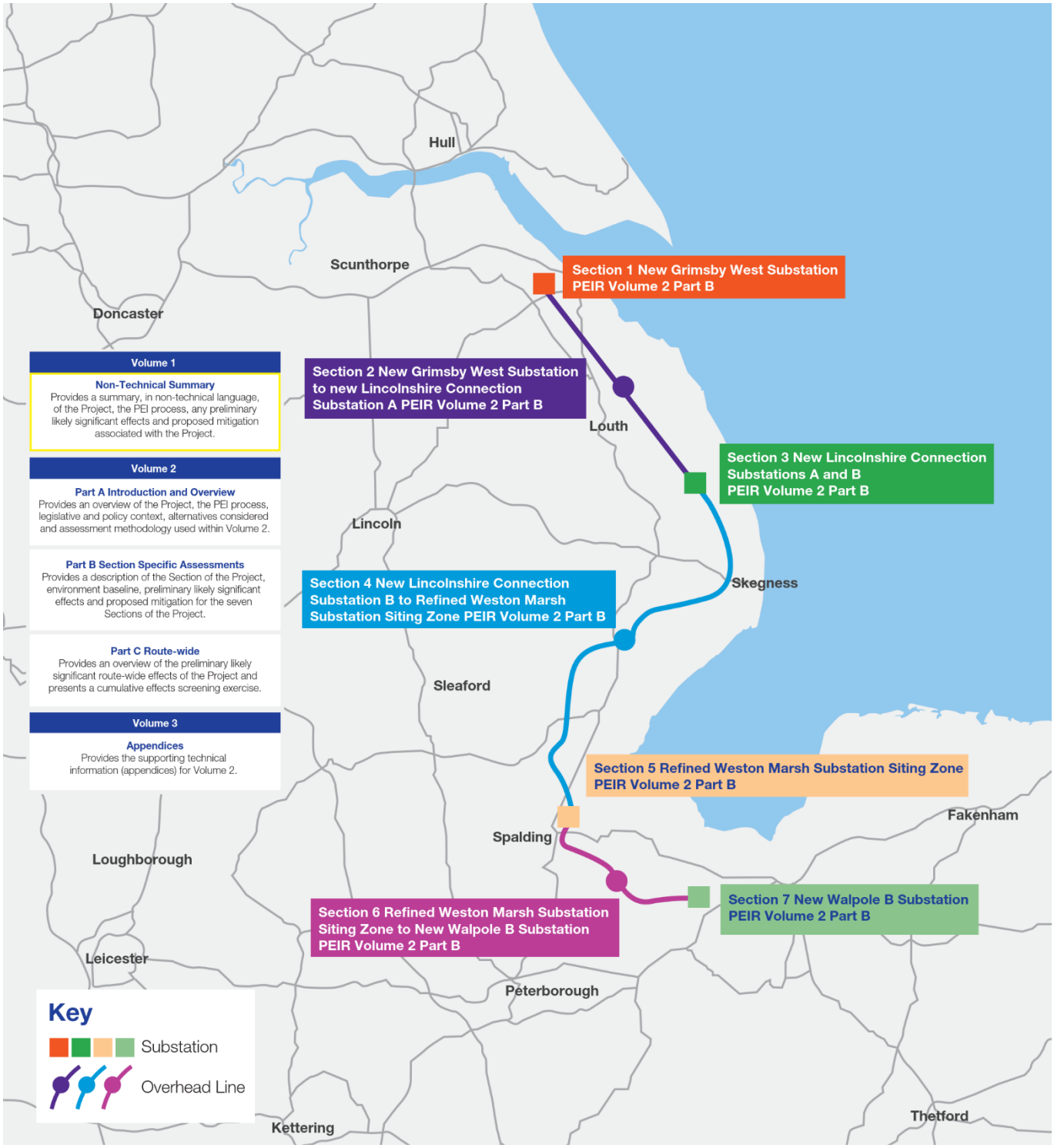
4.5.2 A more detailed overview of the structure of the PEI Report is outlined in **PEI Report Volume 2 Part A Chapter 1 Introduction.**

4.5.3 Due to the size of the Project, the preliminary environmental assessments have been undertaken at a Section-specific level (presented in Volume 2 Part B). Each assessment is presented in the relevant route Section chapter (Sections 1-7 as described in section 3 of this NTS) within **PEI Report Volume 2 Part B Section Specific Assessments.**

4.5.4 For some topics, potential significant environmental effects are also assessed or summarised on a route-wide level, on a greater geographical scale than the route Sections. These are presented in **PEI Report Volume 2 Part C Route-wide.**

4.5.5 The structure of the PEI Report is demonstrated in **Image 4.1** below:

Image 4.1 Structure of the PEI Report



5. Summary of Preliminary Environmental Assessment

5.1 Introduction

5.1.1 This section provides a summary of the preliminary assessments which have been undertaken to identify the likely significant effects of the Project upon the following environmental topics:

i. Landscape;

ii. Visual;

iii. Ecology and Biodiversity;

iv. Historic Environment;

v. Water Environment and Flood Risk;

vi. Geology and Hydrogeology;

vii. Agriculture and Soils;

viii. Traffic and Movement;

ix. Noise and Vibration;

x. Socio-economics, recreation and tourism;

xi. Air Quality;

xii. Health and Wellbeing; and

xiii. Climate.

5.1.2 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, Stage 2 consultation feedback and further stakeholder engagement. A full assessment will be included within the ES.

5.2 Landscape

Scope and Study Area

5.2.1 The potential interactions between the Project and landscape receptors are assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 2 Landscape, PEI Report Volume 2 Part C Route-wide Chapter 2 Landscape** and **PEI Report Volume 3 Part B Sections 1-7.** The preliminary assessment covers effects on the following receptors during construction and operation of the Project:

i. Locally designated landscapes;

ii. Landscape character types (LCT);

iii. Regional landscape character types (RLCT);

iv. Landscape character areas (LCA); and

v. The Lincolnshire Wolds National Landscape (AONB) (which is only relevant geographically in Sections 1-4).

5.2.2 Potential effects on National Character Areas (NCAs) will be assessed at the ES Stage.

5.2.3 The Study Area for the preliminary assessment extends 5 km from the Limits of Deviation (LoD)[10] for the new 400 kV overhead line. This distance was informed by a zone of theoretical visibility (ZTV) map, the scale and appearance of the pylons and gantries, field survey and professional judgment, and is considered sufficient to capture the likely significant landscape effects of the Project.

5.2.4 The ZTV map was produced based on the likely appearance and height of the pylons and gantries for the Project. This shows the geographical area over which the 400 kV overhead line may theoretically be visible. The theoretical visibility of individual pylons is limited to a maximum of 10 km from the LoD of the overhead line.

5.2.5 Potential effects from the Project on the Lincolnshire Wolds National Landscape Area (AONB) are presented in **PEI Report Volume 2 Part C Route-wide Chapter 2 Landscape** and are assessed at a route-wide level. The setting of the Lincolnshire Wolds National Landscape Area (AONB) refers to landscapes within the Project area that, although outside the boundary of the designated area, contribute to its character and visual quality. While these areas are not within the designated area, they are essential in maintaining the scenic value and integrity of the AONB. They influence how the AONB is experienced, providing important visual connections and framing key views both into and out of the designated area.

Existing Baseline

5.2.6 A range of information sources have been used to identify the landscape baseline, such as Ordnance Survey (OS) modelling and mapping, aerial photography, landscape character assessments and other publications. Site surveys were also carried out to help identify viewpoints across the Study Area.

5.2.7 The landscape throughout the Project varies from Section 1 to Section 7. North of Burgh Le Marsh, the coastal plain between the Lincolnshire Wolds and the coastline varies, becoming more hilly with more woodlands and hedgerows to the west. South of Burgh Le Marsh, the landscape is flat and open, with wide views and a fenland character. The Lincolnshire Wolds National Landscape (AONB) lies between 1.8 km and 5 km from the northern and central Sections of the Project and is a narrow band of rolling farmland, parallel to the North Sea coast, offering panoramic views. Much of the farmland is bordered by man-made drains and ditches, and rivers like the Welland and Nene shape the landscape. Existing overhead lines and transport infrastructure also form part of the landscape, more commonly towards the south of the Project where there are existing 132 kV and 400 kV overhead lines.

Mitigation

5.2.8 Measures to avoid or reduce effects to the landscape have been included within the design of the Project. These include carefully choosing the locations and routes of

[10] A Limit of Deviation (LoD) is the maximum extent within which a development can be built.

infrastructure to fit in with the wider landscape, such as by opting for areas with natural screening (e.g. from existing woodland), and where possible, placing pylons and overhead lines close to existing power lines where they are present. In some Sections, pylons of a lower height have been selected to minimise changes to the landscape.

5.2.9 The control and management of environmental effects during the construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects to landscape features. These include measures such as retaining vegetation where possible, protecting areas of retained vegetation and implementing plans for replanting upon completion of construction. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.2.10 Additional measures, which may be implemented to reduce effects that still occur despite the inclusion of the designed-in measures and construction management measures above, include planting of woodland and trees where they have been affected due to the Project.

Preliminary Assessment

5.2.11 The preliminary assessment of effects reported below takes into account the design, control and additional mitigation measures described above.

Section 1

Construction

5.2.12 The construction of the new substation and pylons in Section 1 has the potential to significantly alter the character and perception of the landscape, particularly within LCT 3: Wooded Open Farmland, due to vegetation removal and the visual impact of construction compounds, haul roads, vehicles, and associated activity in the area.

Operation

5.2.13 Introducing new permanent infrastructure, including a new substation in Section 1 would adversely affect the character and perception of the rural farmland in LCT 3: Wooded Open Farmland. Vegetation loss and the prominence of the new infrastructure would likely result in significant effects.

Section 2

Construction

5.2.14 Based on the preliminary assessment, no significant effects are predicted on the landscape receptors within Section 2 during construction.

Operation

5.2.15 Introduction of a line of new pylons into Section 2 would adversely affect the character and perception of the rural landscape and likely result in significant effects, due to vegetation loss and the prominence of the new infrastructure. Several LCTs and RLCTs would be affected.

Section 3

Construction

5.2.16 The construction of the two new substations and pylons in Section 3 would significantly alter the character and perception of the landscape, due to vegetation removal and the visual impact of construction compounds, haul roads, vehicles, and associated activity in the area. Two RLCTs would be affected.

Operation

5.2.17 Introducing new permanent infrastructure, including two new substations in Section 3, would adversely affect the character and perception of the rural landscape and result in likely significant effects due to vegetation loss and the prominence of the new infrastructure. Two RLCTs would be affected.

Section 4

Construction

5.2.18 Based on the preliminary assessment, no significant effects are predicted on the landscape receptors within Section 4 during construction.

Operation

5.2.19 Introduction of new overhead line and pylons into Section 4 would adversely affect the character and perception of the rural landscape and likely result in significant effects, due to vegetation loss and the prominence of the new infrastructure. Several LCTs and RLCTs would be affected.

Section 5

Construction

5.2.20 The construction of up to two new substation and pylons in Section 5 has the potential to significantly alter the character and perception of the landscape, particularly within RLCT 2A Settled Fens and Marshes, due to vegetation removal and the visual impact of construction compounds, haul roads, vehicles, and associated activity in the area.

Operation

5.2.21 Introducing new permanent infrastructure, including up to two new substations in Section 5 would adversely affect the character and perception of the rural farmland within RLCT 2A Settled Fens and Marshes. Vegetation loss and the prominence of the new infrastructure would result in likely significant effects.

Section 6

Construction and operation

5.2.22 Based on the preliminary assessment, no significant effects are predicted for the landscape during construction or operation of the Project.

Section 7

Construction

5.2.23 The construction of the new substation and pylons in Section 7 has the potential to significantly alter the character and perception of the landscape, particularly within LCA D3 Terrington St John, due to vegetation removal and the visual impact of construction compounds, haul roads, vehicles, and associated activity in the area.

Operation

5.2.24 Introducing new permanent infrastructure, including a new substation, into Section 7 would adversely affect the character and perception of the landscape, currently defined as rural farmland (LCA D3 Terrington St John). Vegetation loss and the prominence of the new infrastructure would result in likely significant effects.

Conclusions

5.2.25 Across the Project, the character of the landscape and how it is perceived in several areas would be negatively impacted by the Project and subject to significant effects, notably due to construction activities and the subsequent permanent presence of the new infrastructure.

Summary of route-wide effects on the Lincolnshire Wolds National Landscape (AONB)

5.2.26 Parts of the Project within Sections 1 – 4, are situated within the setting of the Lincolnshire Wolds AONB. This is the landscape surrounding the AONB, which shares similar characteristics and contributes to the perceived continuity of the landscape within the AONB. While the Project itself would be located outside the designated boundary, its presence could still impact the Special Quality of Landscape Character, which is a key contributor to the natural beauty of the AONB and the purpose of its designation.

5.2.27 Likely significant construction and operational impacts are identified for two landscape types associated with the AONB (RLCT 2C: Fen and Marsh Margin Farmlands and RLCT 7A: Chalk Wolds). While the construction effects would be temporary, the Project during operation would introduce large-scale vertical infrastructure into the open, low-lying landscape of RLCT 2C: Fen and Marsh Margin Farmlands, creating a visual contrast between the AONB and its setting. This contrast would weaken the ‘scenic beauty and rural charm’ of the AONB, which is an essential aspect of the Special Quality of Landscape Character and a defining feature of RLCT 7A: Chalk Wolds. Additionally, the presence of infrastructure could impact the AONB’s perceived ‘peace and tranquillity’, particularly in quieter areas away from major roads, further diminishing the Special Quality of Landscape Character.

5.3 Visual

Scope and Study Area

5.3.1 The potential interaction between the Project and Visual receptors is assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 3 Visual** and **PEI Report Volume 3**

Part B Sections 1-7. The preliminary assessment covers effects on the following receptors during construction and operation of the Project:

i. communities; and

ii. recreational routes and receptors.

5.3.2 The Study Area for the preliminary assessment extends 5 km from the Limits of Deviation (LoD) for the new 400 kV overhead line. This distance was informed by a ZTV map, the scale and appearance of the pylons and gantries, field survey and professional judgment, and is considered sufficient to capture the likely significant landscape effects of the Project.

5.3.3 The ZTV map was produced based on the likely appearance and height of the pylons and gantries for the Project. This shows the geographical area over which the 400 kV overhead line may theoretically be visible. The theoretical visibility of individual pylons is limited to a maximum of 10 km from the LoD of the overhead line.

5.3.4 Potential effects from the Project on the Lincolnshire Wolds National Landscape Area (AONB) are presented in **PEI Report Volume 2 Part C Route-wide Chapter 2 Landscape** and are assessed at a route-wide level. The impacts on views from communities and users of recreational routes within or close to the AONB have been assessed.

Existing Baseline

5.3.5 A range of information sources have been used to identify the visual baseline, such as OS modelling and mapping, aerial photography, and local authority local plans. Site surveys were also carried out.

5.3.6 Various communities, defined by parish jurisdiction boundaries, are present within each Section Study Area. The visual assessment is primarily based on community areas with reference to representative viewpoints. As views contribute to the landscape setting enjoyed by people living in and moving around communities there will be an interest in views regardless of their value. There are also communities across Sections 1-4 which may have a higher susceptibility to the Project due to having views towards or being located within the Lincolnshire Wolds National Landscape (AONB) and the types of visual receptors present.

5.3.7 Furthermore, people using recreational routes and receptors have been identified within all Section Study Areas. This includes recreational routes such as the Greenwich Meridian Trail, Lincolnshire Wolds Way, waterways and National Cycle Routes.

Mitigation

5.3.8 Measures to avoid or reduce effects to Visual receptors have been included within the design of the Project. These include carefully choosing the locations and routes of infrastructure to fit in with the wider landscape, such as by opting for areas which have natural screening (e.g. from existing woodland). In Section 2, low-height pylons have been selected to minimise the visual impact of the Project.

5.3.9 The control and management of environmental effects during construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects to visual receptors. These include measures such as retaining

vegetation where possible, protecting areas of retained vegetation and implementing plans for replanting upon completion of construction. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.3.10 Additional measures, which may be implemented to reduce effects that still occur despite the inclusion of the designed-in measures and construction management measures above, include areas of woodland planting and tree planting to provide visual screening of the Project.

Preliminary Assessment

5.3.11 The preliminary assessment of significant effects reported below takes into account the design, control and additional mitigation measures described above.

Section 1

Construction

5.3.12 The construction works within Section 1 will directly impact the community of Aylesby Parish due to activities associated with New Grimsby West Substation, causing a significant effect.

Operation

5.3.13 Introduction of new permanent infrastructure during operation in Section 1 would significantly impact the community of Aylesby Parish due to changes in views from the presence of the proposed overhead line.

Section 2

Construction

5.3.14 The construction works within Section 2 will directly impact the community of Aylesby Parish with adverse impacts on views towards construction of New Grimsby West Substation. Users of the Greenwich Meridian Trail, Nev Cole Way, Wanderlust Way and the Silver Lincs Way may also be impacted by the presence of construction activities within Section 2 causing adverse impacts upon views from the routes.

Operation

5.3.15 Introduction of new permanent infrastructure during operation in Section 2 would impact various communities due to the changes in views from the presence of the proposed overhead line and in views to and from the Lincolnshire Wolds National Landscape (AONB).

5.3.16 Communities which would be directly impacted include the following: Aby with Greenfield Parish, Alvingham Parish, Aylesby Parish, Barnoldby le Beck Parish, Brackenborough with Little Grimsby Parish, Brigsley Parish, Covenham St Mary Parish, Fulstow Parish, Grainsby Parish, Keddington Parish, Laceby Parish, Legbourne Parish, Little Carlton Parish, North Cockrington Parish, North Thoresby Parish, Reston Parish, South Cockrington Parish, Stewton Parish, Strubby with Woodthorpe Parish, Utterby Parish, Waithe Parish, Withern with Stain Parish, and Yarburgh Parish.

5.3.17 Communities which would be indirectly impacted include the following: Claythorpe Parish, Covenham St Bartholomew Parish, East Ravendale Parish, Elkington Parish, Fotherby Parish, Gayton le Marsh Parish, Grimoldby Parish, Hawerby cum Beesby Parish, Holton le Clay Parish, Ludborough Parish, Muckton Parish, North Ormsby Parish, Waltham Parish, and Wyham cum Cadeby Parish.

5.3.18 Introduction of new permanent infrastructure during operation in Section 2 would also impact users of the Greenwich Meridian Trail, Lincolnshire Wolds Way, the Lindsey Loop, Wanderlust Way, Nev Cole Way, Silver Lincs Way, and the Louth Canal and Louth Canal Walk due to changes in views from the proposed overhead line.

Section 3

Construction

5.3.19 The construction works within Section 3 will directly impact the communities of Beesby with Saleby Parish and Bilsby Parish due to adverse impacts on views from the construction of the New LCS A and LCS B.

Operation

5.3.20 Introduction of new permanent infrastructure during operation in Section 3 would impact the communities of Aby with Greenfield Parish, Alford Parish, Beesby with Saleby Parish, Bilsby Parish, Hannah cum Hagnaby Parish, Markby Parish, and Rigsby with Ailby Parish, due to the changes in views from the presence of the proposed overhead line and in views to and from the Lincolnshire Wolds National Landscape (AONB).

5.3.21 Introduction of new permanent infrastructure during operation in Section 3 would also impact users of the Lindsey Loop due to changes in views from the presence of the proposed overhead line.

Section 4

Construction

5.3.22 The construction works within Section 4 will directly impact the community of Bilsby Parish due to adverse impacts on views from the construction of the LCS B.

Operation

5.3.23 Introduction of new permanent infrastructure during operation in Section 4 would impact various communities due to changes in views from the presence of the proposed overhead line.

5.3.24 Communities which would be directly impacted include the following: Bilsby Parish, Bratoft Parish, Burgh Le Marsh Parish, Carrington Parish, Croft Parish, Cumberworth Parish, Eastville Parish, Farlesthorpe Parish, Firsby, Frampton, Frithville and Westville Parish, Hogsthorpe Parish, Holland Fen with Brothertoft Parish, Irby in the Marsh Parish, Kirton Parish, Langriville Parish, Little Steeping Parish, Midville Parish, New Leake Parish, Orby Parish, Sibsey Parish, Stickney Parish, Sutterton Parish, Swineshead Parish, Thornton Le Fen Parish, Thorpe St Peter, Wigtoft Parish, and Willoughby with Sloothby Parish.

5.3.25 Communities which would be indirectly impacted include the following: Amber Hill Parish, Bicker Parish, East Keal Parish, Great Steeping Parish, Halton Holegate Parish, Huttoft Parish, Mumby Parish, Stickford Parish, Toynton All Saints Parish, Toynton St Peter Parish, West Keal Parish, and Wildmore Parish.

Section 5

Construction

5.3.26 The construction works within Section 5 will directly impact the communities of The Moultons Parish and Weston Parish due to adverse impacts on views from the construction of the new substation(s).

Operation

5.3.27 Introduction of new permanent infrastructure during operation in Section 5 would directly impact the communities of The Moultons Parish and Weston Parish due to changes in views from the presence of the proposed overhead line.

Section 6

Construction

5.3.28 The construction works within Section 6 will impact users of the Greenwich Meridian Trail and Nene Way due to adverse impacts upon views from the routes and in close proximity. No communities have been identified as experiencing likely significant effects during construction of the Project in Section 6.

Operation

5.3.29 Introduction of new permanent infrastructure during operation in Section 6 would impact various communities due to changes in views from the presence of the proposed overhead line.

5.3.30 Communities which would be directly impacted include the following: Fleet Parish, Gedney Parish, Holbeach Parish, Newton-in-the-Isle Parish, St James Parish, The Moultons Parish, Tydd St Giles Parish, Weston Parish, West Walton Parish, and Whaplode Parish.

5.3.31 Communities which would be indirectly impacted include the following: Gedney Hill Parish and St Edmund Parish.

5.3.32 Introduction of new permanent infrastructure during operation in Section 6 would also impact users of the Greenwich Meridian Trail and Nene Way due to changes in views from the presence of the proposed overhead line and close proximity.

Section 7

Construction

5.3.33 The construction works within Section 7 will indirectly impact the communities of Walpole Highway Parish and West Walton Parish due to adverse impacts on views from the construction of New Walpole B Substation.

Operation

5.3.34 Introduction of new permanent infrastructure during operation in Section 7 would impact the communities of Walpole Highway Parish and West Walton Parish due to changes in views from the presence of the proposed overhead line.

Conclusions

5.3.35 Across the Project, changes in views caused by construction or operation of the Project are likely. A number of communities and users of several recreational routes would be able to see the Project both during construction and operation, causing significant negative effects.

Summary of route-wide effects on the Lincolnshire Wolds National Landscape (AONB)

5.3.36 Parts of Sections 1 – 4 are situated within the setting of the Lincolnshire Wolds AONB. Notably, these parts of the Project are situated in relatively close proximity to, and parallel with, much of the eastern side of the AONB, resulting in adverse effects on views from some notable vantage points on the higher ground of the Wolds.

5.3.37 A number of communities within Sections 1-4 of the Project, which have views of, or are located within, the Lincolnshire Wolds National Landscape (AONB) have been identified as likely to experience significant effects during the operational phase of the Project due to the presence of new infrastructure impacting views both to and from the AONB. This would also be the case for a number of recreational routes which pass through the AONB and/or its setting.

5.3.38 For communities located within the AONB, significant effects are most likely to arise where the Project is visible across wide, open panoramas. For communities with views towards the AONB, significant effects are primarily due to the introduction of the new overhead line, which would become the prominent feature in currently uninterrupted views, particularly where there are no existing overhead lines or other visual detractors such as wind turbines.

5.3.39 Overall, the introduction of the Project along the eastern side of the AONB, even at a minimum distance of 2 km, is expected to have a likely significant effect on the ‘expansive, sweeping views’ that define the AONB’s Special Quality of Landscape Character.

5.4 Ecology and Biodiversity

Scope and Study/Survey Areas

5.4.1 The potential interaction between the Project and ecological receptors is assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity** and **PEI Report Volume 2 Part C Route-wide Chapter 3 Ecology and Biodiversity.** The preliminary assessment covers effects on the following receptors during construction and operation of the Project:

i. Statutorily designated sites;

ii. Non-statutory designated sites;

iii. Ancient woodland;

iv. Aquatic and terrestrial habitats (including habitats of principal importance);

v. Protected and notable species (including terrestrial invertebrates, great crested newt, reptiles, wintering birds, breeding birds, badger, bats, otter, water vole, fish, aquatic macroinvertebrates and macrophytes, and other notable species); and

vi. invasive non-native species (INNS).

5.4.2 The Study Area for the preliminary assessment (carried out per-Section) comprises the area directly affected by the Project and a buffer around the draft Order Limits of each route Section. This buffer varies for different ecological features. These are:

i. 2 km buffer for protected and notable species and non-statutorily designated sites (e.g. Local Wildlife Sites (LWS), County Wildlife Sites (CWS);

ii. 5 km for statutory designated sites of national and local nature conservation importance (e.g. Sites of Special Scientific Interest (SSSI), National Nature Reserves (NNR) and Local Nature Reserves (LNR)) and wetland birds;

iii. 10 km for statutory designated sites of international nature conservation importance (e.g. Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites; and

iv. 30 km for SAC and SPA where bats or bird species with large foraging ranges are noted as qualifying features

5.4.3 The Survey Areas for the ecological field surveys completed to date typically include land within the draft Order Limits plus a wider buffer where the Project could result in impacts upon habitats or species. The buffer varies depending on the ecological feature being surveyed and can range from 30 m from the draft Order Limits to 500 m. Further detail on the Survey Areas for ecological features can be found in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

Existing Baseline

5.4.4 The existing ecological baseline across the Project has been informed by a range of source information such as online local and national records, aerial photography, and site surveys.

Designated sites

5.4.5 Across the route Sections, there are a number of statutory designated sites of international importance within the various Study Areas. Sites include The Wash SPA and Ramsar site, The Humber Estuary SPA, SAC and Ramsar Site, and The Greater Wash SPA. Sites designated for their national importance are also present within the Study Areas for the route Sections, such as a range of SSSIs and LNRs. Non-designated sites such as LWS and CWS are also present throughout and around the draft Order Limits.

Habitats

5.4.6 The land across the whole route included habitats such as arable fields and farmland surrounded by hedgerows and ditches, or cropland. Several parcels of woodland and watercourses were present throughout.

5.4.7 There are a range of Habitats of principal importance within the Study Areas across the route Sections, including (but not limited to) ancient woodland, lowland meadow, traditional orchard, river habitats, chalk streams and coastal and floodplain grazing marsh.

Protected and notable species

5.4.8 Protected and notable species present across the Study Areas throughout the Project include great crested newts, water vole, wintering birds, breeding birds, badger, bats and hedgehogs. Survey work is ongoing and records of species will be updated for the ES.

Mitigation

5.4.9 National Grid has included mitigation measures into the design of the Project to avoid sensitive receptors and reduce significant effects. Such measures include carefully choosing the locations of pylons and routes of overhead lines to avoid or minimise disturbance to designated sites or species. Other considerations have been made when routeing construction haul roads and ensuring appropriate working distances from notable or protected habitats.

5.4.10 The control and management of environmental effects during construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects upon biodiversity features. These include measures such as the management of dust, waste, water, noise, vibration and soil, management of lighting, amendments to working hours and measures for the reinstatement of affected land. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.4.11 National Grid also have existing policies and procedures to reduce environmental impacts which will be adhered to during operation and maintenance activities, including water management requirements and vegetation management.

5.4.12 Additional measures may be implemented to reduce effects that still occur despite the inclusion of the designed-in measures and construction management measures outlined above. These may include planting of woodland, hedgerows and scattered tree habitats, pond enhancement and establishing mitigation areas for species.

Preliminary Assessment

5.4.13 It should be noted that the assessment of effects on ecological receptors is ongoing and the initial findings presented are based on surveys done to date and professional judgement. A precautionary principle has been applied, whereby when information about a particular receptor is incomplete or uncertain, significant effects have not been excluded. Therefore, most of the ecological receptors identified have been retained in the assessment and the significance of effects reported may be greater than that reported in the ES stage, when all survey data has been collated.

5.4.14 The preliminary assessment of effects reported below takes into account the design and control mitigation measures listed above. The assessment does not take into account the additional measures at this stage as these are subject to further design refinement.

Section 1

Construction

5.4.15 Internationally designated sites, including the Humber Estuary SPA, SAC and Ramsar site and the Greater Wash SPA are located in the Study Area for Section 1. The construction of the Project may cause negative impacts to these sites through pollution (water or air) or habitat loss, noise and/or visual disturbance affecting species such as birds within 'functionally linked land[11]'.

5.4.16 The Humber Estuary SSSI is also located in the Study Area for Section 1 and therefore may be subject to negative effects from construction of the Project, such as pollution or habitat loss, noise and/or visual disturbance of species within functionally linked land.

5.4.17 Important terrestrial habitats throughout Section 1 may also be degraded, damaged, severed or lost as a result of the construction activities. This includes Maud Hole Covert and Wyber's Wood, which are important woodland habitats (habitats of principal importance (HPI)) that may be lost permanently to allow construction of the overhead line and construction access roads. Aquatic habitats, such as watercourses, may be affected where temporary access crossings are needed and species may be disturbed by noise and vibration during construction.

5.4.18 Construction of the Project in Section 1 may also cause the loss or severance of the habitats for protected or notable species such as great crested newts, reptiles, birds, badgers, bats, otters, water vole, fish and other aquatic animals. In a worst-case scenario, there is also a risk of mortality or injury to these species during construction.

5.4.19 Wherever possible, the Project will be designed to avoid important habitats and species. Survey work is ongoing and will continue in 2025 to further inform the assessment of impacts, the design of appropriate mitigation measures and the full assessment will be presented in the ES.

Operation

5.4.20 Potential effects during the operational phase include an increased risk to birds as a result of collision with the new overhead line infrastructure, leading to injury/mortality. Surveys are ongoing and the collision risk will be assessed in detail in the ES.

Section 2

Construction

5.4.21 The nearest international designated site to Section 2 is The Humber Estuary SAC, SPA and Ramsar (approximately 4 km north-east). Other international designated sites identified within the Study Area for Section 2 include the Gibraltar Point SPA and Ramsar and the Wash SPA and Ramsar. Potential impacts could occur through pollution (water or air) reaching designated sites or habitat loss, noise and/or visual disturbance affecting species such as birds or lamprey within functionally linked land.

[11] Areas of land or sea occurring outside a designated site which are considered to be critical to, or necessary for, the ecological or behavioural functions of a qualifying feature of a European designated site

Measures to avoid or mitigate potential impacts on designated sites will be developed as the design progresses and will be presented within the ES.

5.4.22 Other designated sites within the Section 2 Study Area may be affected by construction of the Project and will be assessed in the ES. This includes the Saltfleetby-Theddlethorpe Dunes SAC, designated for its dune habitats. Bradley and Dixon Wood LNR is located in close proximity to the proposed works, meaning there is a risk of construction activities causing disturbance or degradation of habitats and disturbance to any associated species within this site.

5.4.23 Three SSSI's in Section 2 are located within the Study Area or Impact Risk Zone (IRZ) (Muckton Wood SSSI, Humber Estuary SSSI, and Saltfleetby-Theddlethorpe SSSI), may be subject to negative effects from construction of the Project, such as disturbance or damage to the functionally linked land, which may in turn cause negative effects for habitats or species associated with these sites. Measures to avoid or mitigate potential impacts on these designated sites will be developed as the design progresses and will be presented within the ES.

5.4.24 There are ten LWS in close proximity to the works for Section 2 which would be subject to impacts from construction activities, including disturbance/damage to habitats or species associated with these sites. These are Mother and Greenfield Woods LWS, Bradley and Dixon's Woods LWS, Grange Plantation, Aby LWS, Long Eau West LWS, Great Eau LWS, Laceby Beck North LWS, Withern Ings LWS, Withern Wood LWS, River Freshney Headwaters LWS and Waithe Beck East LWS. Further survey work will establish the nature and importance of any receptors associated with these LWS that may be affected by the works and to inform any necessary mitigation.

5.4.25 Terrestrial habitats throughout Section 2 may also be degraded, damaged, severed or lost as a result of the construction activities. This includes areas of coastal and floodplain grazing marsh habitat (a HPI), typically in the Withern area. Hedgerows, scrub and small parcels of woodland may also be affected. Aquatic habitats, such as watercourses, may be affected where temporary access crossings are needed, and species may be disturbed by noise and vibration during construction.

5.4.26 Construction of the Project in Section 2 may also cause the loss or severance of the habitats for protected or notable species such as great crested newts, reptiles, birds, badgers, bats, otters, water vole, fish and other aquatic animals. In a worst-case scenario, there is also a risk of mortality or injury to these species during construction.

5.4.27 Wherever possible, the Project will be designed to avoid important habitats and species. Survey work is ongoing and will continue in 2025 to further inform the assessment of impacts, the design of appropriate mitigation measures and the full assessment will be presented in the ES.

Operation

5.4.28 Potential effects during the operational phase include a risk of collision to birds with the new overhead line infrastructure, leading to injury/mortality. Surveys are ongoing and the collision risk will be assessed in detail in the ES.

Section 3

Construction

5.4.29 There are a number of statutory designated sites in the Study Areas for Section 3, varying from international to local importance. The Humber Estuary SPA and Ramsar site, the Gibraltar Point SPA, Saltfleetby-Theddlethorpe Dunes (and Gibraltar Point) SAC and The Wash SPA and Ramsar site are within the Study Area. The potential for significant effects upon these sites will be assessed within the Report to inform Habitats Regulations Assessment (HRA) and the ES, and significant effects cannot be excluded at this stage in the assessment.

5.4.30 The Saltfleetby-Theddlethorpe Dunes SSSI is located within the Study Area for Section 3, and is designated for its habitats and birds. The construction of the Project may impact some of the functionally linked land used by birds associated with this SSSI. Potential impacts upon the bird assemblage will be assessed once all baseline surveys are complete and will be reported within the ES.

5.4.31 One LWS, Mother and Greenfield Woods LWS, is located adjacent to the proposed works in Section 3, meaning there is a risk of loss or degradation of habitats. Measures outlined in the CoCP will minimise impacts upon habitats during construction. Further survey work will establish the nature and importance of any receptors associated with this LWS that may be affected by the works and inform any additional mitigation measures required.

5.4.32 Important terrestrial and aquatic habitats throughout Section 3 may also be degraded, damaged, severed or lost as a result of the construction activities. Hedgerows, scrub and small parcels of woodland may also be affected.

5.4.33 Construction of the Project in Section 3 may also cause the loss or severance of the habitats for protected or notable species such as great crested newts, reptiles, birds, badgers, bats, otters, water vole, fish and other aquatic animals. In a worst-case scenario, there is also a risk of mortality or injury to these species during construction.

5.4.34 Wherever possible, the Project will be designed to avoid important habitats and species. Survey work is ongoing and will continue in 2025 to further inform the design of appropriate mitigation measures and assessment of impacts and effects. The full assessment will be presented in the ES.

Operation

5.4.35 Potential effects during the operational phase include risk to birds, as a result of collision with the new overhead line infrastructure, leading to injury/mortality. Surveys are ongoing and the collision risk will be assessed in detail in the ES.

Section 4

Construction

5.4.36 Internationally designated sites, including the Gibraltar Point SPA and Ramsar, The Wash and Norfolk Coast SAC, Greater Wash SPA and the Inner Dowsing, Race Bank and North Ridge SAC are located in the Study Area for Section 4. Potential impacts include habitat loss, noise and disturbance within functionally linked land. The potential for significant effects upon these sites will be assessed within the

Report to inform HRA and the ES, and significant effects cannot be excluded at this stage in the assessment. The Inner Dowsing Race Bank and North Ridge SAC is designated for its sandbank and biogenic reef habitats and no significant impacts are predicted.

5.4.37 One LNR (Willoughby Branch Line LNR) and three SSSIs are also located in the Study Area for Section 4. These are the Gibraltar Point SSSI, Troy Wood SSSI and The Wash SSSI. These sites may be subject to negative effects from construction of the project, such as disturbance or damage to the habitats or functionally linked land for species, which may in turn cause negative effects for species (e.g. birds, bats, otter) associated with these sites.

5.4.38 There are nine eight LWS (including Sloothy Low Lane LWS, South Forty Foot Drain LWS and The Lymn LWS, (and others)) located close to or within the draft Order Limits of Section 4. Due to this proximity, these sites are at risk of experiencing negative effects on the habitats within them (through loss or damage), which in turn may affect species associated with these LWS.

5.4.39 Important terrestrial habitats throughout Section 4 may also be degraded, damaged, severed or lost as a result of the construction activities. This includes areas of coastal and floodplain grazing marsh in the Burgh le Marsh area and near the River Welland. Aquatic habitats, such as watercourses, may be affected where temporary access crossings are needed and species may be disturbed by noise and vibration during construction. Measures outlined in the CoCP will minimise impacts upon habitats during construction. Survey work is ongoing and will inform any requirements for additional mitigation or compensation.

5.4.40 Construction of the Project in Section 4 may also cause the loss or severance of the habitats for protected or notable species such as great crested newts, reptiles, birds, badgers, bats, otters, water vole, fish and other aquatic animals. In a worst-case scenario, there is also a risk of mortality or injury to these species during construction.

5.4.41 Wherever possible, the Project will be designed to avoid important habitats and species. Survey work is ongoing and will continue in 2025 to further inform the assessment of impacts, the design of appropriate mitigation measures and the full assessment will be presented in the ES.

Operation

5.4.42 Potential effects during the operational phase include an increased risk to birds, from collision with the new overhead line infrastructure, leading to injury/mortality. Surveys are ongoing and the collision risk will be assessed in detail in the ES.

Section 5

Construction

5.4.43 Internationally designated sites, including the Wash SPA and Ramsar site, The Wash and North Norfolk Coast SAC and the Nene Washes SPA and Ramsar site are located in the Study Area for Section 5. The construction of the Project may cause negative impacts to these sites through pollution (water or air), or habitat loss, noise and disturbance within functionally linked land. The potential for significant effects upon these sites will be assessed within the Report to inform HRA and the ES, and significant effects cannot be excluded at this stage in the assessment.

5.4.44 The Wash SSSI is also located in the Study Area for Section 5, and therefore may be subject to negative effects from construction of the Project, such as habitat loss or disturbance within functionally linked land for bird species. Potential impacts upon the bird assemblage will be assessed once all baseline surveys are complete and will be reported within the ES.

5.4.45 There are also three LWS, including Surfleet Bank LWS, Surfleet Seas End Saltmarsh LWS and Vernatts Drain LWS, which are all located in very close proximity to the preferred siting zone for Section 5. Due to this proximity, these sites are at risk of experiencing negative effects on the habitats within them (through loss or damage), which in turn may affect species associated with these LWS. Measures outlined in the CoCP will minimise impacts upon habitats during construction. Survey work is ongoing and will inform any requirements for additional mitigation or compensation.

5.4.46 Important terrestrial habitats throughout Section 5 may also be degraded, damaged, severed or lost as a result of the construction activities. This includes areas of coastal and floodplain grazing marsh habitat located along the River Welland, and small areas of broadleaved woodland. Aquatic habitats, such as watercourses, may be affected where temporary access crossings are needed or may be disturbed by noise and vibration during construction.

5.4.47 Construction of the Project in Section 5 may also cause the loss or severance of the habitats for protected or notable species such as great crested newts, reptiles, birds, badgers, bats, otters, water vole, fish and other aquatic animals. In a worst-case scenario, there is also a risk of mortality or injury to these species during construction.

5.4.48 Wherever possible, the Project will be designed to avoid important habitats and species. Survey work is ongoing and will continue in 2025 to further inform the assessment of impacts, the design of appropriate mitigation measures and the full assessment will be presented in the ES.

Operation

5.4.49 Potential effects during the operational phase include an increased risk to birds, from collision with the new overhead line infrastructure, leading to injury/mortality. Surveys are ongoing and the collision risk will be assessed in detail in the ES.

Section 6

Construction

5.4.50 There are a number of statutory designated sites in the Study Areas for Section 6, varying from international to local importance. The construction of the Project may cause negative impacts on some of these sites through damage to habitats or habitat loss, noise and disturbance within functionally linked land. Sites potentially affected in Section 6 include The Wash SPA, The Nene SPA and Ramsar site and the Ouse Washes SPA and Ramsar site. The potential for significant effects upon these sites will be assessed within the Report to inform HRA and the ES, and significant effects cannot be excluded at this stage in the assessment.

5.4.51 One SSSI (Islington Heronry SSSI) and two CWS, the River Nene CWS and Honnington House Farm CWS are located close to the proposed works in Section 6 and therefore may be subject to impacts from construction activities, such as

disturbance or damage to the functionally linked land, which may in turn cause negative effects for habitats or species associated with this site. Survey work is ongoing to understand potential impacts and inform any requirements for additional mitigation or compensation.

5.4.52 Important terrestrial and aquatic habitats throughout Section 6 may also be degraded, damaged, severed or lost as a result of the construction activities. This includes Priority Habitat coastal floodplain and grazing marsh, located in the Weston area, near the River Nene and in the Sutton St James area.

5.4.53 Construction of the Project in Section 6 may also cause the loss or severance of the habitats for protected or notable species such as great crested newts (particularly in the Tydd St Giles Fen areas), reptiles, birds, badgers, bats, otters, water vole, fish and other aquatic animals. In a worst-case scenario, there is also a risk of mortality or injury to these species during construction.

5.4.54 Wherever possible, the Project will be designed to avoid important habitats and species. Survey work is ongoing and will continue in 2025 to further inform the assessment of impacts, the design of appropriate mitigation measures and the full assessment will be presented in the ES.

Operation

5.4.55 Potential effects during the operational phase include risk to birds from collision with the new overhead line infrastructure, leading to injury/mortality. Surveys are ongoing and the collision risk will be assessed in detail in the ES.

Section 7

Construction

5.4.56 There are a number of statutory designated sites in the Study Areas for Section 7, varying from international to local importance. The construction of the Project may cause negative impacts on some of these sites through damage to habitats or habitat loss, noise and disturbance within functionally linked land. Sites potentially affected in Section 7 include The Wash SPA and Ramsar site, The Nene Washes SPA and Ramsar site, the Ouse Washes SPA and Ramsar site and The Wash and Norfolk Coast SAC. The potential for significant effects upon these sites will be assessed within the Report to inform HRA and the ES, and significant effects cannot be excluded at this stage in the assessment.

5.4.57 One SSSI (Islington Heronry SSSI) is located close to the proposed works in Section 7 and therefore may be subject to impacts from construction activities, or disturbance within or damage to functionally linked land. Potential impacts upon the SSSI will be assessed once all ornithology surveys are complete and will be reported within the ES. No effects are anticipated to LWS or CWS in Section 7.

5.4.58 Important terrestrial and aquatic habitats throughout Section 7 may also be degraded, damaged, severed or lost as a result of the construction activities. Hedgerows, scrub and small parcels of woodland may also be affected.

5.4.59 Construction of the Project in Section 7 may also cause the loss or severance of the habitats for protected or notable species such as great crested newts, reptiles, birds, badgers, bats, otters, water vole, fish and other aquatic animals. In a worst-case

scenario, there is also a risk of mortality or injury to these species during construction.

5.4.60 Wherever possible, the Project will be designed to avoid important habitats and species. Survey work is ongoing and will continue in 2025 to further inform the assessment of impacts, the design of appropriate mitigation measures and the full assessment will be presented in the ES.

Operation

5.4.61 Potential effects during the operational phase include an increased risk to birds, from collision with the new overhead line infrastructure, leading to injury/mortality. Surveys are ongoing and the collision risk will be assessed in detail in the ES.

Conclusions

5.4.62 The effects presented at this stage are based on the preliminary assessment undertaken to date. Survey work is ongoing and will continue in 2025 to further inform the assessment of impacts, the design of appropriate mitigation measures and the full assessment. The Report to Inform HRA, will be submitted with the ES. As the design progresses, relevant mitigation measures will be embedded into the design of the Project and the assessment of significance for effects reported above may be subject to change.

5.4.63 Across the route as a whole, potential significant effects on statutory designated sites and non-statutory sites, through the loss of functionally linked land, disturbance, loss or degradation of habitats, and changes in hydrology, cannot be ruled out at this stage of assessment. Construction of the Project in its entirety could also result in the loss and/or severance of areas of a range of habitats, including HPIs, and potential significant effects on a range of protected and notable species cannot be ruled out at this stage of assessment.

5.4.64 Opportunities for enhancement and BNG will be considered during the ongoing development of the design for the Project and will be incorporated wherever possible. For example, reinstated and newly created habitats will be monitored, and the project will seek to achieve a 10 per cent net gain in biodiversity.

5.5 Historic Environment

Scope and Study Area

5.5.1 The potential interaction between the Project and heritage assets is assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 5 Historic Environment** and **PEI Report Volume 2 Part C Route-wide Chapter 4 Historic Environment**.

5.5.2 The scope of the preliminary construction assessment covers the following heritage assets:

i. designated heritage assets (scheduled monuments, listed buildings, conservation areas and registered parks and gardens); and

ii. non-designated heritage assets (e.g. buried archaeological remains, earthwork remains, non-designated historic buildings and structures, non-designated historic parks and gardens, tracks/routeways and artefact scatters).

5.5.3 The scope of the preliminary operation assessment covers the following heritage assets:

i. designated heritage assets (scheduled monuments, listed buildings, conservation areas and registered parks and gardens); and

ii. non-designated heritage assets (e.g. earthwork remains, non-designated historic buildings and structures, non-designated historic parks and gardens and tracks/routeways).

5.5.4 Potential impacts arising from the construction phase on the setting of heritage assets may arise due to:

i. temporary short-term impacts from construction activities which can be incremental until construction is completed, caused by the movement of mechanical plant, light, noise pollution and dust; and/or

ii. permanent long-term impacts as a result of the introduction of the physical form and appearance of the built infrastructure into the landscape during the construction stage and continuing for the operational duration of the Project.

5.5.5 Potential impacts arising from the construction phase also include direct physical impacts on designated heritage assets within the draft Order Limits resulting from construction works e.g. topsoil stripping and groundworks for the construction access haul road, pylon working areas, construction compounds and drainage.

5.5.6 For the preliminary assessment, no additional significant effects are considered likely through operation over and above those already identified relating to the long-term presence of the Project in the landscape under the construction phase. The summary of assessment below is therefore not divided into construction and operation as with other topics. Further assessment of potential significant operational effects will be undertaken in the ES.

5.5.7 The Study Area for the preliminary assessment (carried out per-Section) comprises the area directly affected by the Project and a buffer around the draft Order Limits of each route Section. This buffer varies for different heritage assets. These are:

i. 1 km from the draft Order Limits for non-designated heritage assets;

ii. 3 km from the draft Order Limits for all designated heritage assets; and

iii. 3-5 km from the draft Order Limits for designated heritage assets of high value (World Heritage Sites, scheduled monuments, grade I and II* listed buildings and grade I and II* registered parks and gardens) where setting is a key factor in their value and where this setting extends over a large area.

5.5.8 Designated heritage assets of high value located beyond the 5 km Study Area have been assessed where there is potential for their setting to be impacted by the Project.

Existing Baseline

5.5.9 The existing Historic Environment baseline across the Project has been informed by a range of source information such as online local and national records, historic mapping, geological mapping, aerial photography and site surveys.

Designated heritage assets

5.5.10 Across the Study Area, there are a numerous designated heritage assets , including scheduled monuments, conservation areas, listed buildings and registered parks and gardens. There are no World Heritage Sites or registered battlefields located within the Study Area.

Non-designated heritage assets

5.5.11 Non-designated heritage assets exist within the area directly affected by the Project and across the 1 km Study Area. The types of non- designated heritage assets include crop marks, settlement sites, farmsteads and buildings (extant and demolished), moated sites, Royal Air Force (RAF) bases and earthworks (including roddons and sea defences) amongst others.

Archaeological and historic background

5.5.12 A range of archaeological and historic activity exists across the Project Study Areas, such as remains dated to the Second World War, evidence of medieval occupation, Iron Age activity, and more.

Mitigation

5.5.13 National Grid has included mitigation measures into the design of the Project to avoid designated sites and sensitive receptors and reduce significant effects. Such measures include carefully choosing the locations of pylons and routes of overhead lines, access roads, construction compounds and temporary structures to avoid or lessen impacts on the setting of heritage assets and buried archaeological remains. Other considerations have been made when routeing construction haul roads and ensuring appropriate working distances from heritage assets.

5.5.14 The control and management of environmental effects during construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects to heritage assets. These include measures such as the management of lighting, amendments to working hours, management plans for unexpected discoveries of archaeological remains, and re-instatement of hedgerows or fences to screen views of the Project from heritage assets. Archaeological trial trenching and other surveys would be used to evaluate known assets or locations of interest prior to construction to inform what measures are needed. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.5.15 Additional measures may be implemented to reduce effects that still occur despite the inclusion of the designed-in measures and construction management measures above, such as planting of vegetation to screen views of the Project to minimise impacts to the setting of assets.

Preliminary Assessment

5.5.16 The preliminary assessment of effects considers the design, control and additional mitigation measures above.

Section 1

5.5.17 One designated asset, the Two moated sites at Healing Hall scheduled monument, is located within the 3 km Study Area for Section 1, and may experience significant temporary effects from construction activities. As a designated heritage asset of high value, the construction of the new substation and temporary works to the existing overhead line in Section 1 may temporarily alter the setting of the monument through construction traffic, noise and also through the introduction of additional temporary pylons to the skyline to the south. Permanent effects to the setting of the monument due to the presence of new infrastructure in Section 1 are not anticipated to be significant.

Section 2

5.5.18 The preliminary assessment has identified ten designated heritage assets within the Study Areas for Section 2 that have the potential to experience temporary and/or permanent significant effects. These include six scheduled monuments (Round Barrow Cemetery, North Cockerington Hall moated site, Moated Site west of Hall Farm, Castle Hill motte and bailey castle, Toot Hill motte and bailey castle and Castle Hill: moated site with Civil War earthworks), one grade I listed building (Church of St Martin) and three grade II listed buildings (Little Laceby Farmhouse, The Salter Fen Lock and The Manor House).

5.5.19 All of these designated assets may be subject to significant temporary setting impacts due to construction activities such as the movement of mechanical plant, light, noise pollution and dust. Permanent significant effects caused by the permanent presence of new overhead line and pylon infrastructure are also anticipated to the setting of these assets (with the exception of The Moated Site west of Hall Farm scheduled monument, Little Laceby Farmhouse and the Salter Fen Lock).

5.5.20 One non-designated asset may also be significantly affected by the construction of the Project. This is the former site of RAF Manby Airfield, located to the east of Manby, within the draft Order Limits, which may experience temporary and permanent changes to its setting as a result of construction of the Project.

Section 3

5.5.21 The preliminary assessment has identified seven designated heritage assets within the Study Areas for Section 3 that have the potential to experience temporary and/or permanent significant effects caused by construction of the two new substations and associated overhead lines. These include two scheduled monuments (St Mary's Priory and Markby Priory), one grade II* listed building (Church of St Andrew) and four grade II listed buildings (Manor Farmhouse, Manor House, Barn at Thoresthorpe Manor House and Stable Block at Thoresthorpe Manor House).

5.5.22 The above assets may be subject to significant temporary impacts to their setting as a result of construction activities such as the movement of mechanical plant, light, noise pollution and dust. Significant permanent setting impacts are also anticipated

for these assets due to the presence of new infrastructure in the landscape during operation.

5.5.23 A number of non-designated assets may also be subject to temporary setting impacts associated with construction activities for the Project in Section 3 and/or permanent changes to the setting of these assets arising from the presence of the new substations and overhead lines. These include a redeveloped 19th century farmstead and a deserted medieval village.

5.5.24 Geophysical survey undertaken within the sites for the two new substations in Section 3 have identified five groups of previously unknown anomalies, interpreted to be possibly of archaeological origin (as former field boundaries or former ridge and furrow cultivation). Further archaeological evaluation is required to confirm the extent, date and value of the buried archaeological remains. The enclosure may date to the prehistoric, Roman or medieval period and may represent either rural settlement remains or agricultural enclosures. There is potential for topsoil stripping and ground works, associated with construction of LCS B to remove this asset which would result in a significant effect.

Section 4

5.5.25 The preliminary assessment has identified five designated heritage assets within the Study Areas for Section 4 that have the potential to experience temporary and/or permanent significant effects caused by construction of the new overhead lines. These include three scheduled monuments (Butterbump round barrow cemetery, Castle Hill: a motte castle 250 m east of Hanby Hall Farm and Manwar Ings: remains of a motte and bailey castle), the grade I listed Parish Church of St Botolph and the grade II listed Bridge over Twenty Foot Drain.

5.5.26 Construction of the Project may temporarily alter the settings of the Butterbump round barrow cemetery and Bridge over Twenty Foot Drain through construction traffic, noise and plant movement. Changes in the landscape surrounding the assets, such as through the introduction of temporary scaffolding, may also negatively affect the settings. For the Bridge over Twenty Foot Drain, other direct physical impacts may arise from a construction access haul road, meaning the bridge may potentially be used by construction traffic causing increased noise, vibration and potential physical damage. It is, however, noted that the bridge is already used by traffic as it forms part of a local road in the area.

5.5.27 Potential significant permanent setting impacts are also anticipated for all of the above assets (with the exception of the Bridge over Twenty Foot Drain) due to the presence of new infrastructure (notably overhead lines and pylons) in the landscape during operation.

5.5.28 Four non-designated built heritage assets identified within the Study Area for Section 4 may also be subject to temporary impacts as a result of the construction of the Project. These include Bilsby Farm, Moat House, Asperton Farm and Barbridge House. The construction and presence of overhead lines and pylons in close proximity to these assets may negatively affect their setting. Notably, the construction of a number of access roads and working areas for pylons in Section 4 may affect these non-designated assets. The permanency of the infrastructure in this Section is not thought to lead to significant effects on these assets.

Section 5

5.5.29 The preliminary assessment has identified six designated heritage assets within the Study Areas for Section 5 that have the potential to experience temporary and/or permanent significant effects. These include one scheduled monument (Wykeham Chapel), the grade I listed Wykeham Chapel of St Nicholas and four grade II listed buildings (Wraggmarsh House Farmhouse, Pigeoncote to the South of Wraggmarsh House, Chapel Farmhouse and associated pair of gate piers).

5.5.30 The proximity and potential intervisibility of these assets with the likely construction activities and, depending on the location of the proposed new substation and overhead line infrastructure within the Refined Siting Zone, have the potential to result in likely significant effects (which may be temporary and/or permanent).

5.5.31 Five non-designated historic farmsteads, located within land that is excluded from but surrounded by the Refined Siting Zone boundary may be subject to significant effects as a result of changes to their setting, depending on the location of the proposed up to two new substations and overhead lines.

5.5.32 One non-designated built heritage asset identified within the Study Area for Section 5 may also be subject to impacts. The Welland House Farm, in Weston, is located in close proximity to the Refined Siting Zone, and therefore may experience significant effects as above during construction of the Project.

Section 6

5.5.33 The preliminary assessment has identified four designated heritage assets within the Study Areas for Section 6 that have the potential to experience temporary and/or permanent significant effects. These include two scheduled monuments (the King's Hall moated site and a Romano-British settlement south of Shell Bridge), the grade I listed Moulton Windmill and the grade II listed Ingleborough Mill.

5.5.34 The above assets may be subject to significant temporary impacts to their setting as a result of construction activities such as the movement of mechanical plant, light, noise pollution and dust. Notably, the construction access route and access point along Mill Road would cause temporary negative effects to the setting of Ingleborough Mill through increased traffic and disturbance in the area. Permanent significant effects caused by the presence of new overhead line and pylon infrastructure are also anticipated to the setting of these assets

5.5.35 Four non-designated built assets may also be impacted by the construction of the Project in Section 6. These include Sunset Cottage (King's Hall), two 19th century farmsteads and an unnamed farmstead. Construction works, including construction access routes and access points proposed in close proximity to these assets are likely to cause significant temporary effects to the setting. The permanency of the infrastructure in this Section is not thought to lead to significant effects on these assets.

Section 7

5.5.36 Potential impacts identified during the construction phase include direct physical impacts on heritage assets, within the draft Order Limits of Section 7, resulting from construction works, for example, topsoil stripping and groundworks for the New Walpole B Substation, cable sealing end compound, access routes, pylon working

areas, construction compounds, associated drainage and ecological and landscape mitigation.

5.5.37 The preliminary assessment has identified one designated heritage asset within the Study Areas for Section 7 that has the potential to experience temporary or permanent significant effects. This is the grade II listed Faulkner House. Construction activities in close proximity to the asset, notably the presence of a construction compound to the north west and associated access route, may cause significant temporary effects to the setting of Faulkner House. The construction and permanency of the New Walpole B Substation and associated overhead lines and pylons may also impact the wider setting of the farmstead, leading to possible significant permanent effects.

5.5.38 A non-designated heritage asset, the medieval moated enclosure and great house located adjacent to the draft Order Limits, is the subject of an application to designate the asset as a scheduled monument. As such the remains of the medieval moated enclosure and great house have been assessed as being of high value and the asset considered as if it were a scheduled monument. The asset will not experience any direct physical impacts as a result of the Project; however, construction activities in close proximity to the asset, notably the presence of a construction compound to the west and associated access route, may cause significant temporary effects to the setting of the medieval moated enclosure and great house. The construction and permanency of the New Walpole B Substation and associated overhead lines and pylons may also impact the wider setting of the asset, leading to possible significant permanent effects.

Conclusions

5.5.39 Overall, significant effects on a number of designated heritage assets and non-designated heritage assets may arise from the various construction activities across the Project, such as the movement of mechanical plant, light, noise, dust pollution and the presence of construction compounds and access haul roads, resulting in temporary changes to the setting of the assets.

5.5.40 Permanent significant effects, including permanent changes to the settings of heritage assets , may also be experienced due to the introduction of new infrastructure into the landscape across the entirety of the Project.

5.5.41 Possible direct significant effects on buried archaeological remains may arise in Section 3 during construction of the Project, where ground works required for the construction of new substations may cause the truncation or loss of parts of the buried assets.

5.6 Water Environment and Flood Risk

Scope and Study Area

5.6.1 The potential interaction between the Project and Water Environment and Flood Risk receptors is assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 6 Water Environment and Flood Risk** and **PEI Report Volume 2 Part C Route-wide Chapter 5 Water Environment and Flood Risk**. The preliminary assessment covers effects on the following receptor groups during construction of the Project:

i. aquatic environment receptors, including main rivers, Water Framework Directive (WFD) rivers and transitional waterbodies, Internal Drainage Board (IDB)-maintained watercourses and ordinary watercourses;

ii. water resource receptors, including licensed surface water abstractions, unlicensed surface water abstractions for private water supply and discharges to surface waters; and

iii. flood risk receptors, including property and infrastructure at risk of flooding.

5.6.2 The preliminary assessment for the operation and maintenance of the Project covers effects on flood risk receptors only.

5.6.3 The Study Area for the preliminary assessment (carried out per Section) for the Water Environment and Flood Risk consists of the draft Order Limits and an additional 500 m buffer.

Existing Baseline

5.6.4 A range of information sources have been used to identify the Water Environment and Flood Risk baseline, such as Met Office UK Climate averages, the WFD Catchment Data Explorer database, various mapping sources including OS mapping, and various EA data sources and flood model outputs. A site walkover will be undertaken in 2025 to supplement the data used at this stage.

Climate

5.6.5 Average annual total rainfall in the locality of the Sections ranges from 594 mm in Section 4 to 660 mm in Section 7.

5.6.6 Across the Eastern and Northeastern England districts there has been minimal increase in annual rainfall between 1991-2020. The average annual maximum temperatures and average annual minimum temperatures both exhibit an increasing trend for the same period.

Hydrology and surface water features

5.6.7 Surface water features identified within the various Study Areas include a network of main rivers, ditches and small watercourses. A number of tidal main rivers run throughout the Sections including the Welland and the River Nene.

5.6.8 Within the Section Study Areas there are various IDB-maintained watercourses, including watercourses which fall within North East Lindsey IDB, Lindsey Marsh IDB, Witham Fourth District IDB, Black Sluice IDB, the Welland and Deepings IDB, the South Holland IDB, North Level IDB, and Kings Lynn IDB.

Water quality and WFD status

5.6.9 WFD classifications for the water bodies are informed by monitoring a range of parameters that are indicators of water quality from the EA monitoring sites. Within the various Study Areas, the overall waterbody status of various WFD waterbodies in direct connectivity to the Sections ranges from bad to moderate.

5.6.10 Furthermore, drinking water safeguard zones and drinking water protected areas are located within the Study Area for Section 2 while nitrate vulnerable zones are located with the Study Areas for Section 1, Section 4 and Section 5.

Surface water dependant nature conservation sites

5.6.11 Within the Study Areas for Section 2, Section 4, Section 5 and Section 6 there are non-statutory nature conservation sites which are dependent on surface water. This includes sites which are CWS and LWS.

Water resources

5.6.12 There are various surface water abstractions and consented surface water discharges within the various Section Study Areas. The Study Areas also cross various Abstraction Licensing Strategy (ALS) regions.

Flood risk and land drainage

5.6.13 The EA Flood Map for Planning provides an indication of the likelihood of flooding from fluvial and tidal sources, with Flood Zones 1, 2 and 3 indicating a Low, Medium and High likelihood of flooding respectively. All Flood Zones are present across the various Study Areas, although areas of floodplain are much more extensive in the low-lying southern part of the Project area (Sections 4 to 7). Numerous areas at risk of surface water flooding are present within the Study Areas.

5.6.14 Furthermore, risk of flooding from reservoir failure has been identified within some Study Areas (Section 2 and Section 4). Risk of flooding from sewers is not considered a significant source of flooding in any of the Study Areas due to the predominantly rural setting.

5.6.15 There are various flood defences situated with the Study Areas, with flood defences being particularly important in providing flood protection to the extensive low-lying areas in Sections 4 to 7. Numerous external receptors for flood risk effects have been identified including agricultural land and undeveloped land, agricultural premises and commercial property, residential properties, and essential infrastructure that is vulnerable to flooding.

Mitigation

5.6.16 National Grid has included mitigation measures into the design of the Project to avoid sensitive receptors and reduce significant effects. Such measures include carefully choosing the locations of pylons and new substations to avoid areas of higher flood risk, where possible. Other design mitigation of relevance to the Water Environment and Flood Risk topic includes the following: use of Sustainable Urban Drainage Systems (SuDS) as far as practicable at new substations and crossing of large or sensitive watercourses with clear span bridges.

5.6.17 The control and management of environmental effects during construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects on the Water Environment and Flood Risk. These include use of a Drainage Management Plan, compliance by the contractor with all relevant consent conditions and retention of riverbank and in-channel vegetation where possible. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.6.18 Based on the preliminary assessment presented below, additional mitigation measures are not anticipated to be required in relation to effects on the aquatic environment and water resources and are not assumed within the assessment of effects. However, this will remain under review during the completion of further

assessment and development of the ES. At this stage of the assessment, potentially significant effects have been concluded for flood risk for some Sections where siting of project infrastructure within floodplain areas cannot be avoided. Additional mitigation to address these risks will be developed following further flood modelling work and consultation with the relevant flood risk management authorities and will be presented in the ES. At this stage, a precautionary approach has been taken whereby these effects have been assessed without further mitigation being in place.

Preliminary Assessment

Section 1

Construction

Water environment and resource receptors

5.6.19 Based on the preliminary assessment, no likely significant effects are predicted for the water environment and resource receptors during construction. The small number of watercourses that traverse Section 1 will not be impacted.

Flood risk receptors

5.6.20 None of the new proposed infrastructure or overhead line modifications would be located in within a floodplain. Therefore, no significant effects with regards to flood risk are anticipated.

Operation and maintenance

5.6.21 Based on the preliminary assessment, no likely significant effects are predicted for the water environment/resource and flood risk receptors during operation and maintenance.

Section 2

Construction

Water environment and resource receptors

5.6.22 A number of drains and main rivers including the Great Eau and Waithe Beck are present within the Section 2 Study Area, however the measures to be implemented during construction of the Project mean that no significant effects are anticipated.

Flood risk receptors

5.6.23 While a number of pylons in Section 2 are located within floodplains, with the implementation of control measures during construction, no significant effects are predicted with regards to flood risk.

Operation and maintenance

5.6.24 Based on the preliminary assessment, no likely significant effects are predicted for the water environment/resource and flood risk receptors during operation and maintenance.

Section 3

Construction

Water environment and resource receptors

5.6.25 Based on the preliminary assessment, no likely significant effects are predicted for the water environment receptors during construction. While there would be potential effects to the Wold Grift Drain and a number of watercourses from watercourse crossings for construction, these are not anticipated to be significant.

Flood risk receptors

5.6.26 Neither LCS A or B would be constructed within a floodplain, and none of the pylons are located in floodplains across Section 3. There is therefore no significant effects on flood risk receptors in Section 3.

Operation and maintenance

5.6.27 Based on the preliminary assessment, no likely significant effects are predicted for the water environment/resource and flood risk receptors during operation and maintenance.

Section 4

Construction

Water environment and resource receptors

5.6.28 Based upon the preliminary assessment, no significant effects are predicted for water environment and water resource receptors within the Section 4 Study Area (including the Cowcroft Drain and River Steeping main rivers and a network of drains present), as a result of the construction phase of the Project.

Flood risk

5.6.29 However, the construction of the overhead lines within Section 4 may cause changes or the loss of floodplain storage, as some of the temporary works and infrastructure would be located within Flood Zone 3. This may increase flood risk, which would be a significant effect without additional mitigation.

Operation and maintenance

5.6.30 Based on the preliminary assessment, no likely significant effects are predicted for the water environment/resource and flood risk receptors during operation and maintenance.

Section 5

Construction

Water environment and resource receptors

5.6.31 Based on the preliminary assessment, no significant impacts to watercourses within the area are anticipated.

Flood risk receptors

5.6.32 The construction works associated with the potential two new substations within Section 5 are predominantly located within Flood Zone 3, which may lead to the change or loss of floodplain storage capacity, which may increase flood risk in the area. This would include the construction of access routes, compounds and up to two new substations compounds, watercourse crossings and stockpiling of materials within the floodplain (e.g. due to temporary storage of soils or imported aggregate). This may increase flood risk, which would be a significant effect without additional mitigation.

Operation and maintenance

5.6.33 The introduction of new permanent infrastructure during operation in Section 5 may lead to increased flood risk due to loss of floodplain storage and/or a change in floodplain flow conveyance. This may increase flood risk, which would be a significant effect without additional mitigation. It should be noted that the impacts of the presence of up to two new substations are subject to further design development, which will include consideration of the need for flood protection and compensatory flood storage.

Section 6

Construction

Water environment and resource receptors

5.6.34 While a number of watercourses are present within the Section 6 Study Area, no significant effects are anticipated to these.

Flood risk receptors

5.6.35 A number of pylons are located in Flood Zones 2 and 3 across Section 6, and the construction of these and overhead lines may cause changes or the loss of floodplain storage. This may increase flood risk, which would be a significant effect without additional mitigation.

Operation and maintenance

5.6.36 Based on the preliminary assessment, no likely significant effects are predicted for the Water Environment and Floor Risk during operation and maintenance.

Section 7

Construction

Water environment and resource receptors

5.6.37 While a number of watercourses are present within the Section 7 Study Area, no significant effects are anticipated to these following implementation of control measures during construction.

Flood risk receptors

5.6.38 There is, however, potential for the construction activities in Section 7 to cause changes or the loss of floodplain storage, as all proposed infrastructure (including the New Walpole B Substation and associated pylons) is located within Flood Zone 3 and in a floodplain. This may increase flood risk, which would be a significant effect without additional mitigation.

Operation and maintenance

5.6.39 Introduction of new permanent infrastructure during operation and maintenance in Section 7 would lead to increased flood risk due to loss of floodplain storage and/or a change in floodplain flow conveyance. This may increase flood risk, which would be a significant effect without additional mitigation.

Conclusions

Water environment and resource receptors

5.6.40 On a route-wide level, based on the preliminary assessment, no significant effects are anticipated on water environment receptors as a result of the construction or operation and maintenance of the Project. While a number of rivers, watercourses and drain networks are present throughout the Project, no significant effects are anticipated on these following the implementation of measures during construction and operation of the Project.

Flood risk receptors

5.6.41 Over the whole Project, there are a number of areas of higher flood risk where proposed infrastructure would be built and present, causing potential significant effects on flood risk. This is notably in Sections 4, 5, 6 and 7.

5.6.42 It is noted that this assessment is preliminary and significant effects to flood risk receptors at this stage are assumed in the absence of additional mitigation. Further investigations are required to understand the flood risk in the Study Areas across the Project. The assessment may be subject to change due to the ongoing design development of the Project, Stage 2 consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

5.7 Geology and Hydrogeology

Scope and Study Area

5.7.1 The potential interaction between The Project and Geology and Hydrogeology receptors is assessed in **PEI Report Volume 2 Sections 1-7 Chapter 7 Geology and Hydrogeology**.

5.7.2 The scope of the construction assessment covers the following receptor groups:

i. human health (in the context of land contamination only);

ii. groundwater aquifers;

iii. groundwater abstractions;

iv. soil/land quality (in the context of land contamination only);

v. structures; and

vi. designated geological conservation sites (although no assessment is required as there are no designated sites present within influencing distance of the draft Order Limits).

5.7.3 The scope of the operation assessment covers the following receptor groups:

i. human health (future land users) – only in the context of land contamination assessments;

ii. groundwater aquifers;

iii. groundwater abstractions; and

iv. structures.

5.7.4 For the purposes of the Geology and Hydrogeology assessment, a general Study Area of the draft Order Limits plus a 250 m buffer for geological receptors and a 500 m buffer for hydrogeological receptors has been applied.

Existing Baseline

5.7.5 Baseline conditions have been identified from existing desk-based records, including geological information available from the British Geological Survey (BGS), historical Ordnance Survey mapping, hydrogeological records such aquifer mapping and groundwater protection designations (available from the Department for Environment, Food and Rural Affairs (Defra) and the Environment Agency), and various other data sources such as Local Authority records, information from the Environment Agency about groundwater abstractions and pollution incidents, and commercially available geo-environmental data sets.

Geology

5.7.6 The bedrock geological setting of the northern half of the Study Area can, in general terms, be characterised as consisting of chalk deposits from the Cretaceous Period. The southern half of the Study Area can be characterised as consisting of mudstones and siltstones of the Jurassic Period. A small area between the chalk and the mudstones is recorded to be underlain by variable geology of the Claxby Ironstone

Formation, Spilsby Sandstone Formation and deposits of interbedded mudstone and limestone.

5.7.7 The bedrock geology is overlain by a cover of more recent superficial deposits throughout the Study Area. In the northern half of the Study Area these are predominantly composed of Devensian (Glacial) Till. In the southern half of the Study Area, they are predominantly composed of Tidal Flat deposits.

5.7.8 Within the northern half of the Study Area, sporadic infrequent localised areas of other superficial deposits are also present, including alluvium around river channels, peat deposits, lacustrine deposits, glaciofluvial deposits, and areas of river terrace deposits (typically sand and gravel).

Hydrogeology

5.7.9 The chalk deposits are designated as a Principal Aquifer. This aquifer is abstracted locally for a variety of uses, ranging from commercial uses to private water supplies to public drinking water abstractions. Parts of the aquifer are designated as groundwater Source Protection Zones (SPZ). Parts of the chalk aquifer within the Study Area are also in Drinking Water Safeguard Zones for nitrate and within Nitrate Vulnerable Zones.

5.7.10 The chalk aquifer is predominantly overlain by Glacial Till and, towards its southern extent within the Study Area, by Tidal Flat deposits. Whilst both Glacial Till and Tidal Flat deposits can be of variable composition, it is common for these deposits to contain a high clay and / or silt content meaning that they often display low permeability and provide protection to deeper groundwater in the chalk aquifer from the effects of near surface construction processes.

5.7.11 To the south of the part of the Study Area underlain by chalk, the Spilsby Sandstone Formation deposits display a similar hydrogeological sensitivity and setting.

5.7.12 The southern half of the Study Area displays a much lower hydrogeological sensitivity. The Jurassic mudstones in this area are designated by the Environment Agency as Unproductive Strata, meaning that they generally have negligible capacity for water supply or baseflow to rivers.

5.7.13 In addition to the bedrock geology aquifer designations described above, the superficial geology carries aquifer designations as Secondary A / B / Undifferentiated Aquifer (depending on the geology type), other than the Tidal Flat deposits which are classified as Unproductive Strata.

Environmental setting

5.7.14 The vast majority of land within the Study Area has been agricultural/rural dating back to the first available Ordnance Survey mapping editions. Therefore, the likelihood of construction work encountering historical ground contamination is generally low. However, there are occasional localised areas of other previous land uses within the Study Area, such as historical sewage treatment works, historical pollution incidents, historical landfills, and railways. A small proportion of these are within the draft Order Limits.

5.7.15 Small areas of safeguarded minerals are present within the Study Area. These include deposits of glaciofluvial sand and gravel, alluvium (sand and gravel), and limestone.

Mitigation

5.7.16 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable such as landfills and designated geological sites. The presence of sensitive groundwater receptors, in particular inner SPZ (SPZ I), and the importance of preventing adverse effects on these receptors, has been a relevant consideration in the design of the Project.

5.7.17 A Preliminary CoCP has been prepared for this project, provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**. The Preliminary CoCP outlines the control and management mitigation measures to be implemented during the construction of the Project to prevent or reduce effects that could affect Geology and Hydrogeology receptors.

5.7.18 At this stage of assessment, additional mitigation measures are not anticipated to be required in relation to Geology and Hydrogeology effects. However, this will remain under review during the completion of further assessment and development of the ES.

Preliminary Assessment

5.7.19 The preliminary assessment of effects reported below takes into account the design and control mitigation measures, as previously described.

Section 1

Construction

5.7.20 The Project involves construction of the proposed New Grimsby West Substation on land that is underlain by a chalk Principal Aquifer and is within an SPZ. The chalk aquifer is anticipated to be overlain by around 20m of predominantly low permeability superficial deposits, which is likely to afford substantial prevention from any risk of contamination or physical effects on the chalk aquifer from construction activities. Whilst some localised areas of more permeable superficial deposits may be present, the control measures in the Preliminary CoCP would prevent significant adverse effects on groundwater in either these deposits or the underlying chalk aquifer.

5.7.21 The possible exception to the shallow construction scenario described above would be piled foundations (for example if needed for substation structures) should these need to extend to the chalk, as theoretically this could present a risk of creating a pathway for vertical migration and mixing of groundwater from shallow levels into the deeper chalk aquifer. Suitable control measures would be adopted to prevent this, through a Foundation Works Risk Assessment (FWRA) under the Preliminary CoCP. Examples of measures that may arise from a FWRA include the selection of specific piling techniques that prevent the creation of open pathways and minimising any physical downwards transport of soil.

5.7.22 Based on the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 1 as a result of the construction phase of the Project.

Operation

5.7.23 The proposed new Grimsby West Substation in Section 1 will introduce new impermeable surfacing. Given the anticipated substantial thickness of low permeability Glacial Till cover across the majority of the substation footprint, the installation of impermeable surfacing and engineered drainage presents minimal change to aquifer recharge and would not be expected to affect the levels (quantities) of groundwater in the chalk aquifer. Any effects on shallow groundwater would also be expected to be minimal.

5.7.24 Based on the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 1 as a result of the operation and maintenance of the Project.

Section 2

Construction

5.7.25 The Project will involve construction work on land that is underlain by a chalk Principal Aquifer and SPZ, with groundwater abstractions for public drinking water supply within the Study Area (although outside the draft Order Limits). It is anticipated that this construction work will predominantly be in the low permeability superficial deposits that overlie the chalk, preventing direct interaction with the sensitive chalk aquifer at depth. This shallow construction work will also be subject to control measures under the CoCP to ensure that the Project does not cause contamination or mobilise pre-existing contamination (for example, in the limited areas where construction is on previously used land such as a former RAF airfield), and also that it does not cause any significant adverse physical effects on groundwater in the aquifer such as an increase in sediment.

5.7.26 It is possible that the construction of the Project may require piled foundations for new pylons. This work may be an exception to the scenario described above as piled foundations may intersect the chalk aquifer. In the event that piling was required then this would be controlled through a Foundation Works Risk Assessment (FWRA) under the Preliminary CoCP to prevent any significant effects on the aquifer. Examples of measures that may arise from a FWRA include the selection of specific piling techniques that prevent the creation of open pathways and minimising any physical downwards transport of soil.

5.7.27 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 2 as a result of the construction phase of the Project.

Operation

5.7.28 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 2 as a result of the operation and maintenance of the Project.

Section 3

Construction

5.7.29 The Project will involve construction work on land that is underlain by a chalk Principal Aquifer and SPZ. It is anticipated that this construction work will predominantly be in the low permeability superficial deposits that overlie the chalk, preventing direct interaction with the sensitive chalk aquifer at depth. This shallow construction work will also be subject to control measures under the CoCP to ensure that the Project does not cause contamination or mobilise pre-existing contamination, and also that it does not cause any physical effects on groundwater in the chalk aquifer such as an increase in sediment.

5.7.30 Whilst there are no public water drinking abstractions within the Study Area in Section 3, there are two private water supply boreholes and one abstraction for agricultural purposes. The abstractions are located in localised areas of glaciofluvial deposits (general a more permeable superficial deposit type than the predominant Glacial Till). However, nearby construction activities in areas underlain by the glaciofluvial deposits are restricted to very minor ground disturbance (road widening) so no significant effects are anticipated.

5.7.31 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 3, as a result of the construction phase of the Project.

Operation

5.7.32 The LCS A and LCS B substations within Section 3 will introduce new impermeable surfacing. However, both substations are underlain by superficial deposits predominantly comprising Glacial Till deposits, which are likely to be primarily cohesive and of low permeability/infiltration capacity. Therefore, the construction of new impermeable surfaces is not considered likely to alter infiltration and recharge substantively. Therefore, there would not be consequent significant effects on groundwater levels (quantities) in aquifers.

5.7.33 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 3 as a result of the operation and maintenance of the Project.

Section 4

Construction

5.7.34 The Project will involve construction work on land that is underlain by chalk and sandstone Principal Aquifers and SPZ, with groundwater abstractions for public drinking water supply within the Study Area (although outside the draft Order Limits). It is anticipated that this construction work will predominantly be in the low permeability superficial deposits, preventing direct interaction with the sensitive chalk and sandstone aquifers at depth. This shallow construction work will also be subject to control measures under the CoCP to ensure that the Project does not cause contamination or mobilise pre-existing contamination, and also that it does not cause any significant physical effects on groundwater in the aquifer such as an increase in sediment.

5.7.35 It is possible that the construction of the Project may require piled foundation for new pylons. This work may be an exception to the scenario described above as piled foundations may intersect the chalk or sandstone aquifers. In the event that piling was required then this would be controlled through a Foundation Works Risk Assessment (FWRA) under the Preliminary CoCP to prevent any significant effects on the aquifers. Examples of measures that may arise from a FWRA include the selection of specific piling techniques that prevent the creation of open pathways and minimising any physical downwards transport of soil.

5.7.36 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 4 as a result of the construction phase of the Project.

Operation

5.7.37 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 4 as a result of the operation and maintenance of the Project.

Section 5

Construction

5.7.38 The Study Area for Section 5 is uniformly underlain by Unproductive Strata (Tidal Flat deposits over Jurassic mudstones and siltstones), with no recorded groundwater abstractions. As such, the hydrogeological sensitivity is low and no significant effects are expected.

5.7.39 The risks to human health or low sensitivity groundwater from land contamination are generally considered to be low based on the recorded previous land use, and can be suitably controlled through the control measures in the Preliminary CoCP.

5.7.40 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 5 as a result of the construction phase of the Project.

Operation

5.7.41 The construction of the proposed New Weston Marsh Substations A and B in Section 5 will introduce new impermeable surfacing and engineered drainage. This would not be expected to substantively affect shallow groundwater levels in the area. Therefore, there is not considered to be a significant effect.

5.7.42 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 5 as a result of the operation and maintenance of the Project.

Section 6

Construction

5.7.43 Land that is within the draft Order Limits for the purpose of road widening during the construction of the Project includes land recorded to be within the boundaries of the historical Manor Farm and Bird's Drove Corner household waste landfills. The

currently available information suggests that any disturbance of this ground would likely be restricted to very shallow excavations (for road widening) at the perimeter of the former landfill sites.

5.7.44 Should pre-construction ground investigation identify household waste deposits in construction areas, then the adoption of suitable health and safety working procedures for excavations in such materials, and environmental controls to prevent/minimise the generation of dust or leachate, as outlined in the Preliminary CoCP, would adequately mitigate health risks to construction workers and adjacent land users, preventing significant effects.

5.7.45 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 6 as a result of the construction phase of the Project.

Operation

5.7.46 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 6 as a result of the operation and maintenance of the Project.

Section 7

Construction

5.7.47 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 7 as a result of the construction phase of the Project. There is an absence of hydrogeological receptors (both superficial deposits and bedrock are classified as Unproductive Strata) and no identified previous land use of contaminative concern.

Operation

5.7.48 The proposed construction of the New Walpole B Substation in Section 7 will introduce new impermeable surfacing. However, the Tidal Flat deposits are predominantly cohesive and are designated as Unproductive Strata, unlikely to yield or store significant quantities of groundwater. Therefore, the construction of new impermeable surfaces is not considered likely to alter infiltration and recharge substantively.

5.7.49 Based upon the preliminary assessment, no significant effects are predicted for Geology and Hydrogeology receptors within Section 7 as a result of the operation and maintenance of the Project.

Minerals Safeguarding (Route Wide)

5.7.50 A route-wide assessment of the potential effects of the Project on safeguarded minerals has been carried out. This has identified three categories of safeguarded minerals within the draft Order Limits: glaciofluvial sand and gravel, alluvium (sand and gravel), and limestone. There is also a Mineral Safeguarding Area for oil workings associated with the Keddington Oil Well site in Section 2, although this relates to the workings (oil) rather than the mineral deposit itself.

5.7.51 The minerals safeguarding assessment indicates that the construction and operation of the Project does not have the potential to cause significant effects, due to factors

such as the small extent of the glaciofluvial deposits, the presence of silt and clay within the alluvium, and the presence of interbedded mudstone in the limestone, all of which mean that it is highly unlikely that the minerals would be worked commercially in the draft Order Limits.

5.7.52 It is therefore concluded, based on the route-wide minerals safeguarding assessment, that there are no potentially significant effects in relation to mineral safeguarding requiring assessment by EIA.

Conclusions

5.7.53 Based upon the preliminary assessment, the most notable potential effects relate to the construction of the Project in areas with high hydrogeological sensitivity in Sections 1, 2, 3 and 4. This sensitivity relates to the chalk aquifer (and sandstone in the case of Section 4). Consideration of the nature and anticipated depth of the construction activities and the geological setting (specifically the nature and depth of the superficial deposits that afford protection to the chalk and sandstone aquifers) indicates that, with suitable control measures as specified in the CoCP, the effects on the chalk and sandstone aquifers and associated groundwater abstractions would not be significant.

5.7.54 Other construction phase effects assessed include those relating to contamination risks to human health (these are low due to the largely rural nature of the Study Area), ground gas risks, hydrogeological effects on less sensitivite shallow groundwater in superficial deposits, and land instability effects. In all cases, with suitable control measures as specified in the CoCP, the effects of the construction of the Project would not be significant.

5.7.55 The most notable effects relating to the operation of the Project would be changes to the permeability of the ground at new substation sites, which will involve the installation of new impermeable surfacing. Assessment of these effects in the context of the specific geological circumstances at each site indicates that the change from baseline would be such that no significant effect on groundwater quantities in aquifers would occur.

5.7.56 Overall, no significant effects are predicted for Geology and Hydrogeology receptors during construction and operation of the Project.

5.8 Agriculture and Soils

Scope and Study Area

5.8.1 The potential interaction between the Project and agricultural and soil receptors are assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 8 Agriculture and Soils** and **PEI Report Volume 2 Part C Route-wide Chapter 6 Agriculture and Soils**. The preliminary assessment covers effects on the following, during construction and operation (and maintenance) of the Project:

i. Agricultural Land Classification (ALC), including Best and Most Versatile (BMV) land;

ii. soil function; and

iii. Agricultural Landholdings.

5.8.2 The Study Area for the assessment of Agriculture and Soils comprises the draft Order Limits. The assessment is confined to within this boundary as no land will be affected outside of this.

Existing Baseline

5.8.3 A desk study was undertaken drawing on information from existing mapping from the BGS, OS, Soilscape mapping, Agricultural Land Classification (ALC) mapping and maps of agri-environmental, woodland and forestry schemes.

Geology

5.8.4 In the northernmost sections of the Project, geology present is predominantly Chalk (The Welton Chalk Formation, Hunstanton Chalk Formation and Burnham Chalk Formation).

5.8.5 Superficial drift present towards the north of the project is predominantly Devensian Till (Diamicton).

5.8.6 The geology present as the Project extends south is mudstone, Oxford Clay Formation and Ampthill Clay Formation.

5.8.7 Clay and silt tidal flat deposits form the superficial drift present towards the south of the Project.

Soils

5.8.8 Available national soil survey mapping data indicates that the soils across all sections of the Project will be providing a range of soil functions, and as such are considered to have a range of sensitivities from very high to medium.

Agricultural Land Classification

5.8.9 The Provisional ALC mapping shows that the draft Order Limits largely comprise a mixture of Grade 1 (excellent quality agricultural land), Grade 2 (very good quality agricultural land), and Grade 3 (good to moderate quality agricultural land) land. Some Grade 4 (poor quality agricultural land) land is present in Section 4.

Woodland and Forestry Scheme

5.8.10 Woodland and Forestry Schemes are government provided incentives that reward landowners for the creation and management of woodlands. Throughout the Project scattered parcels of land are subject to Woodland Grant Schemes and Felling License Agreements.

Agri Environment Schemes

5.8.11 Agri Environment Schemes comprise government funding to farmers and land managers to support activities which improve the local environment. There are different levels of Environmental Stewardship Schemes which have increasing complexity and land management requirements across the Project.

Land use

5.8.12 Aerial imagery and OS mapping indicate that the agricultural land use within the draft Order Limits is predominantly arable, with some grassland and woodland areas. Field boundaries are lined with hedges, trees and roads.

Agricultural land holdings

5.8.13 The number of agricultural land holdings and the general land use across each section of the Project has been identified to inform the preliminary assessment. This does not, for the PEI Report, include an assessment of individual landholdings in terms of viability (such as disruption or proportion of landholding taken temporarily or permanently); an assessment will be presented in the ES based on the level of further information gained and with a focus on the permanent impacts and on any land uses which may be considered more sensitive (such as orchards, high value cropping systems or livery stables).

Mitigation

5.8.14 The Project and draft Order Limits have been designed to avoid significant effects as far as practicable. This has included rationalising the design to minimise the temporary and permanent land take required and positioning infrastructure (such as pylons and access routes) as close as is practicable to field boundaries to minimise impacts to agricultural operations.

5.8.15 **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP** contains a list of relevant good practice measures relating to Agriculture and Soils. These include reinstatement of land used temporarily to its pre-construction condition and use; undertaking works in accordance with good practice soil handling techniques; and where practicable and safe to do so, maintaining access to land and field access points throughout the construction period.

5.8.16 Additional mitigation measures are not anticipated to be required in relation to Agriculture and Soils effects. However, this will remain under review during the completion of further assessment and development of the ES.

Preliminary Assessment

5.8.17 The preliminary assessment of effects reported below takes into account the design and control mitigation measures previously described.

Section 1

Construction

Agricultural Land Classification

5.8.18 The agricultural land required in Section 1 is provisionally mapped as Grade 3. Provisional mapping does not differentiate between Grade 3a (BMV) and Grade 3b (non-BMV) land, so until ALC grades are confirmed through site surveys, it cannot be confirmed what proportion of provisional Grade 3 land is actually BMV. Grade 3a land is considered to have a high sensitivity and for the purposes of the assessment

presented in the PEI Report for all Sections all Grade 3 land is assumed to be likely to comprise BMV land.

5.8.19 For the purpose of the assessment across all Sections it is assumed. as a worst case. that all land within the draft Order Limits may be temporarily impacted and temporarily removed from agricultural production during the construction phase. The total extent of land required during construction would be 86.3 ha. Of this, 57.6 ha would be reinstated to its preconstruction condition and grade. Of the land required during construction, 28.7 ha would be required for permanent infrastructure (the new substation, pylon footprints). The permanent loss of this land (assumed to be BMV land) is considered likely significant.

Soil function

5.8.20 The permanent loss of 28.7 ha of soils would affect the associated soil ecosystem services. However, where practicable, all surplus soil resources would be re-used within the Project where, depending on the proposed land use, some soil ecosystem services will be retained, restored or potentially enhanced. Until it can be confirmed how practicable it will be to re-use the soil resources it is considered that this would result in an impact of large magnitude on soil function and is considered likely significant.

Operation and maintenance

5.8.21 Based upon the preliminary assessment, no further likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project.

Section 2

Construction

Agricultural Land Classification

5.8.22 The agricultural land required in Section 2 is provisionally mapped as Grade 3 land and as such is assumed to likely comprise BMV land.

5.8.23 The total extent of land required during construction would be 700.2 ha. Of this, 582.3 ha would be reinstated to its preconstruction condition and grade; the impacts of the temporary land take are considered to be likely significant. The land required includes all agricultural land needed for the construction of the proposed Project infrastructure including pylons, temporary haul roads and temporary land requirements.

5.8.24 Of the land required during construction, 117.8 ha would be required for permanent infrastructure (pylon body footprints). The permanent loss of this land (assumed to be BMV land) is considered to be likely significant.

Soil function

5.8.25 The permanent loss of approximately 117.8 ha of agricultural land and the soils would affect the associated soil ecosystem services. However, where practicable, surplus soil resources would be re-used within the Project where, depending on the proposed land use, some soil ecosystem services will be retained, restored or

potentially enhanced. Until it can be confirmed how practicable it will be to re-use the soil resources it is considered that this would result in an impact of large magnitude on soil function and is considered likely significant.

Operation and Maintenance

5.8.26 Based upon the preliminary assessment, no further likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project.

Section 3

Construction

Agricultural Land Classification

5.8.27 All agricultural land required in Section 3 is provisionally mapped as Grade 2 and Grade 3, and as such is considered likely to comprise BMV land. Grade 2 land is considered to have a very high sensitivity, and Grade 3a land is considered to have a high sensitivity.

5.8.28 The total extent of land required during construction would be 178.5 ha. Of this, 111.6 ha would be reinstated to its preconstruction condition and grade; the impacts of the temporary land take are considered to be likely significant. The land required includes all agricultural land needed for the construction of the proposed Project infrastructure including pylons, access roads and temporary land requirements.

5.8.29 Of the land required during construction, 66.9 ha would be required for permanent infrastructure, (proposed New LCS A and B, associated accesses and pylon body footprints . The permanent loss of this land (assumed to be BMV land) is likely significant.

Soil function

5.8.30 The permanent loss of66.9 ha of soils would affect the associated soil ecosystem services. However, where practicable, all surplus soil resources would be re-used within the Project where, depending on the proposed land use, some soil ecosystem services will be retained, restored or potentially enhanced. Until it can be confirmed how practicable it will be to re-use the soil resources it is considered that this would result in an impact of large magnitude on soil function and is considered likely significant.

Operation and maintenance

5.8.31 Based upon the preliminary assessment, no further likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project.

Section 4

Construction

Agricultural Land Classification

5.8.32 The agricultural land required in Section 4 is provisionally mapped predominantly as Grades 1, 2 and 3, with only a small area of Grade 4 land, and as such is considered likely to comprise BMV land. Grades 1 and 2 land is considered to have a very high sensitivity, and Grade 3a land is considered to have a high sensitivity.

5.8.33 The total extent of land required during construction would be 1104.4 ha. Of this, 957.2 ha would be reinstated to its preconstruction condition and grade; the impacts of the temporary land take are considered to be likely significant. The land required includes all agricultural land needed for the construction of the proposed Project infrastructure including pylons, access roads and temporary land requirements.

5.8.34 Of the land required during construction, 147.2 ha would be required for permanent infrastructure (pylon body footprints). The permanent loss of this land (assumed to be BMV land) is likely significant.

Soil function

5.8.35 The permanent loss of 147.2 ha of soils would affect the associated soil ecosystem services. However, where practicable, all surplus soil resources would be re-used within the Project where, depending on the proposed land use, some soil ecosystem services will be retained, restored or potentially enhanced. Until it can be confirmed how practicable it will be to re-use the soil resources it is considered that this would result in an impact of large magnitude on soil function and is considered likely significant.

Operation and maintenance

5.8.36 Based upon the preliminary assessment, no further likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project.

Section 5

Construction

Agricultural Land Classification

5.8.37 During construction there would be a potential loss of BMV land (defined as ALC Grades 1, 2 and 3a) from agricultural productivity.

5.8.38 Given the uncertainty of the location of the potential two new substations and further design work required, the assessment has assumed that all land within Section 5 may be temporarily impacted and temporarily removed from agricultural production during the construction phase. This is based on the requirement to secure land temporarily for both the construction of up to two new substations and associated infrastructure and the stringing of conductors between pylons.

5.8.39 At this stage, the Study Area includes more land than will be required to construct and operate the Project. This area of land will be refined as the design matures. The siting area is characterised by land classified ALC Provisional Grade 1 (Excellent). Grade 1 land is considered to have a very high sensitivity.

5.8.40 Given the extent of Provisional Grade 1 land at and around the proposed new substation location/s, opportunities for the preferential use of lower grade land will be very limited. The permanent loss of this land is likely to give rise to a significant effect due to the footprint of up to two new substations resulting in permanent loss of Provisional Grade 1 land.

Soil function

5.8.41 The permanent loss of the soil would affect the associated soil ecosystem services. However, where practicable, the Project would seek to re-use surplus soil resources within the design, and depending on the proposed land use, some soil ecosystem services would be retained, restored, or potentially enhanced. Until it can be confirmed how practicable it would be to re-use the soil resources, it is considered that this would likely result in a significant adverse effect on soil function.

Operation and maintenance

5.8.42 Based upon the preliminary assessment, no further likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project.

Section 6

Construction

Agricultural Land Classification

5.8.43 The agricultural land required in Section 6 is provisionally mapped as Grades 1 and 2, and as such is considered likely to comprise BMV land. Grade 1 and 2 land is considered to have a very high sensitivity.

5.8.44 The total extent of land required during construction would be 481.1 ha. Of this, 422.5 ha would be reinstated to its preconstruction condition and grade; the impacts of the temporary land take would be likely significant. The land required includes all agricultural land needed for the construction of the proposed Project infrastructure including pylons, access roads and temporary land requirements.

5.8.45 Of the land required during construction, 58.6 ha would be required for permanent infrastructure (pylon footprints). The permanent loss of this land (assumed to be BMV land) would be likely significant.

Soil function

5.8.46 The permanent loss of 58.6 ha of soils would affect the associated soil ecosystem services. However, where practicable, all surplus soil resources would be re-used within the Project where, depending on the proposed land use, some soil ecosystem services will be retained, restored or potentially enhanced. Until it can be confirmed how practicable it will be to re-use the soil resources it is considered that this would

result in an impact of large magnitude on soil function and is considered likely significant.

Operation and maintenance

5.8.47 Based upon the preliminary assessment, no further likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project.

Section 7

Construction

Agricultural Land Classification

5.8.48 The agricultural land required in Section 7 is provisionally mapped principally as Grade 2 land, with potentially a small area of Grade 1 land, and as such is considered likely to comprise BMV land. Grade 1 and 2 land is considered to have a very high sensitivity.

5.8.49 The total extent of land required during construction would be 104.8 ha. Of this, 50.7 ha would be reinstated to its preconstruction condition and grade; the impacts of the temporary land take would be likely significant. The land required includes all agricultural land needed for the construction of the proposed Project infrastructure including a new substation, pylons, access roads and temporary land requirements.

5.8.50 Of the land required during construction, 54.2 ha would be required for permanent infrastructure (new substation and pylon body footprints). The permanent loss of this land (assumed to be BMV land) would be likely significant.

Soil function

5.8.51 The permanent loss of 54.2 ha of soils would affect the associated soil ecosystem services. However, where practicable, surplus soil resources would be re-used within the Project where, depending on the proposed land use, some soil ecosystem services will be retained, restored or potentially enhanced. Until it can be confirmed how practicable it will be to re-use the soil resources it is considered that this would result in an impact of large magnitude on soil function and is considered likely Significant.

Operation and maintenance

5.8.52 Based upon the preliminary assessment, no further likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project.

Conclusions

5.8.53 Construction of the whole Project would require the temporary loss of approximately 3,900 ha of land, some of which is considered likely to comprise BMV land, which is a significant effect. Most of this land, however, would be reinstated following construction and areas would be restored. Following construction, some of the land used for construction would be permanently lost due to the presence of the whole

Project infrastructure (for example pylons and new substations), which is a significant effect.

5.9 Traffic and Movement

Scope and Study Area

5.9.1 The potential interaction between the Project and Traffic and Movement receptors is assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 9 Traffic and Movement**. The preliminary assessment covers effects on the following receptors during construction and operation of the Project:

i. road users (drivers of all vehicles, including Heavy Goods Vehicles (HGVs) and emergency services) of the highway network;

ii. public transport users (bus passengers) of the highway network;

iii. pedestrians and cyclists on the highway network;

iv. railway users;

v. navigable waterway users; and

vi. pedestrians, cyclists and equestrians on Public Rights of Way (PRoW) and promoted/recreational routes.

5.9.2 The Study Area for Traffic and Movement comprises highway links assumed to be used to provide access for construction vehicles and considers the impacts to traffic, bus routes and pedestrian/cycle routes along these highway access routes. The Study Area also includes pedestrian/cycle/equestrian routes and PRoW networks as well as railways and waterways that are crossed by the draft Order Limits.

Existing Baseline

5.9.3 A range of information sources have been used to identify the Traffic and Movement baseline, including review of Google Maps and OS open maps, identification of designated non-motorised user routes for pedestrians, cyclists and equestrians from Sustrans, the Long Distance Walkers Association and Local Authority Definitive/PRoW map(s), rail information from National Rail, waterways information from the EA, Navigation Authority and The Inland Waterways Association, data from the Department for Transport (DfT) including traffic count data and personal injury collision accident data and traffic growth factors. Traffic count data has also been obtained from site surveys.

5.9.4 Each Section contains highway links which form part of the Primary Access Routes and Workers Access Routes. Primary Access Routes are identified as a series of roads and junctions, between the Strategic Road Network (SRN)[12] and the site accesses, suitable for access by large construction vehicles, that are planned to be used by HGVs. Workers Access Routes are identified as a series of roads and junctions which are not promoted as construction HGV routes, but which could be used by workers to travel to site. These are identified as likely routes between residential areas, key employment/skills centres and the site accesses. A description

[12] The Strategic Road Network is the national network of motorways and major A roads maintained and operated by National Highways

of each of these links, including the type of carriageway, character, speed limits, highway constraints, presence of street lighting, bus routes, on-carriageway parking, and pedestrian, equestrian and cycle provision, can be found in **PEI Report Volume 2 Part B Sections 1-7 Chapter 9 Traffic and Movement**. Where available, baseline traffic flows are taken from the DfT's traffic counters and traffic surveys have been undertaken on links that do not have available or recent DfT counts. Appropriate growth factors have been applied to the count data where required to present all traffic data for a consistent 2024 Base Year. Sensitive receptors along each highway link within each Section Study Area have been identified. In addition, collision data has identified collision clusters at various locations along the highway links and a congestion rating has been identified. Furthermore, bus services that run along some highway links forming the Primary Access Routes and Worker Access Routes have been identified.

5.9.5 Railway infrastructure is present within proximity to the draft Order Limits in some Sections. This includes the Lincolnshire Wolds leisure rail line which the Section 2 draft Order Limits pass close by to, and a main rail line running between Sleaford, Boston and Skegness which the Section 4 draft Order Limits crosses at three locations.

5.9.6 The draft Order Limits cross a number of navigable waterways in some Sections. This includes Steeping River, River Witham, Black Sluice Navigation/South Forty Foot Drain and River Welland, as well as a number of Drains forming part of the Witham Navigable Drains (Castle Dyke, Newham Drain, West Fen Drain, and Stonebridge Drain) within Section 4 and the River Nene within Section 6. The Section 5 Refined Siting Zone crosses the River Welland.

5.9.7 There are a number of PRoWs and Promoted/Recreational Routes potentially affected by the proposed works within the draft Order Limits for each Section.

Mitigation

5.9.8 National Grid has included mitigation measures into the design of the Project to avoid sensitive receptors and reduce significant effects as far as practicable. For Traffic and Movement some of the design refinement that has taken place includes construction traffic routed along classified roads as far as possible, construction vehicles routed off the public highway along haul roads to access construction compounds and construction areas where possible, construction traffic crossing of rail lines or navigable waterways avoided or use existing vehicle crossings where possible, road closures/diversions kept to a minimum, and PRoW closures/diversions avoided or minimised where possible.

5.9.9 The control and management of environmental effects during construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects on Traffic and Movement. These include careful management of PRoW closures and diversions set out through a Public Rights of Way Management Plan (PRoWMP) and use of a Construction Traffic Management Plan (CTMP) which will set out construction details including vehicle types, routes, working hours, welfare arrangements and monitoring systems. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.9.10 Additional mitigation measures are not anticipated to be required in relation to Traffic and Movement effects. However, this will remain under review during the completion of further assessment and development of the ES.

Preliminary Assessment

5.9.11 The preliminary assessment of effects reported below takes into account the design and control mitigation measures previously described.

5.9.12 At this preliminary stage, significant effects upon users of some highway links during construction cannot be ruled out. Highway links requiring more detailed assessment have been identified within the PEI Report and will be discussed and agreed with the relevant highway authorities. No detailed assessment, in terms of severance, delay (junction assessment), highway safety and fear and intimidation, has yet been undertaken to determine the magnitude of impacts. Subsequent effects upon users of the highway network as a result of the Project will be reported in the ES.

Section 1

Construction

5.9.13 During construction in Section 1, drivers, bus passengers, pedestrians and cyclists may be impacted by increased construction traffic flows. For drivers, increased construction traffic flows may cause severance, changes in journey time, driver delay and highway safety effects on some sections of the A16, and on the A1136 and Aylesby Road. Bus passengers may be impacted by delays due to congestion on these highway links where bus services run. Meanwhile, pedestrians and cyclists may be impacted by severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects on the A1136 Great Coates and Aylesby Road.

5.9.14 Furthermore, routes from Immingham Dock to New Grimsby West Substation and Grimsby Dock to New Grimsby West Substation may be impacted by the movement of Abnormal Indivisible Loads (AILS) and hazardous loads. This is due to highway works/temporary closures leading to congestion and increased journey times for road users.

Operation

5.9.15 Based on the preliminary assessment, no likely significant effects are predicted for Traffic and Movement during operation.

Section 2

Construction

5.9.16 During construction in Section 2, drivers, bus passengers, pedestrians and cyclists may be impacted by increased construction traffic flows. For drivers, increased construction traffic flows may cause severance, changes in journey time, driver delay and highway safety effects on some sections of the A16, A18, A1173, A158, A1136, Aylesby Road, A157 Kenwick Hill, Waltham Road, Station Road, Bollingbroke Road, Brackenborough Road, Westfield Road and A157 Main Road. Bus passengers may be impacted by delays due to congestion on these highway links where bus services run. Meanwhile, pedestrians and cyclists may be impacted by severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects on some sections of the A16, A158, A1136, Aylesby Road, Waltham Road and A157 Main Road.

Operation

5.9.17 Based on the preliminary assessment, no likely significant effects are predicted for Traffic and Movement during operation.

Section 3

Construction

5.9.18 During construction in Section 3, drivers, bus passengers, pedestrians and cyclists may be impacted by increased construction traffic flows. For drivers, increased construction traffic flows may cause severance, changes in journey time, driver delay and highway safety effects on some sections of the A16, A18, A1173, A158, A1104, A1111, A157, Rye Lane, Armtree Road and B1192. Bus passengers may be impacted by delays due to congestion at A1104 in Alford. Meanwhile, pedestrians and cyclists may be impacted by severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects on some sections of the A16, A158 and on the A1104 and A1111 in Alford and Bilsby and Rye Lane.

Operation

5.9.19 Based on the preliminary assessment, no likely significant effects are predicted for Traffic and Movement during operation.

Section 4

Construction

5.9.20 During construction in Section 4, drivers, bus passengers, pedestrians and cyclists may be impacted by increased construction traffic flows. For drivers, increased construction traffic flows may cause severance, changes in journey time, driver delay and highway safety effects on some sections of the A16, A18, A1173, A158, A1104, A1111, Gunby Road, Marsh Road, Gunby Lane, B1195, Station Road, Thorpe Bank, Spilsby Road, Fodder Dike Bank, Midville Road, B1184 Hale Lane, Armtree Road Road, B1192 Main Road and B1192 Langrick Road. Bus passengers may be impacted by delays due to congestion on these highway links where bus services run; the A16, A1104 and A158. Meanwhile, pedestrians and cyclists may be impacted by severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects on some sections of the A16, A158, A1104, A1111, Gunby Road, Marsh Road, Fodder Dike Bank, B1184 Hale Lane and Armtree Road.

Operation

5.9.21 Based on the preliminary assessment, no likely significant effects are predicted for Traffic and Movement during operation.

Section 5

Construction

5.9.22 During construction in Section 5, drivers, bus passengers, pedestrians and cyclists may be impacted by increased construction traffic flows. For drivers, increased

construction traffic flows may cause severance, changes in journey time, driver delay and highway safety effects on some sections of the A16, Marsh Road, Stone Gate, A151 and the A17. Bus passengers may be impacted by delays due to congestion on these highway links where bus services run. Meanwhile, pedestrians and cyclists may be impacted by severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects on some sections of the A16.

Operation

5.9.23 Based on the preliminary assessment, no likely significant effects are predicted for Traffic and Movement during operation.

Section 6

Construction

5.9.24 During construction in Section 6, drivers, bus passengers, pedestrians and cyclists may be impacted by increased construction traffic flows. For drivers, increased construction traffic flows may cause severance, changes in journey time, driver delay and highway safety effects on some sections of the B1168, B1165, Middle Broad Drove, Broad Drove East, Newgate Road, B1165 Church Lane and the B1165. Bus passengers may be impacted by delays due to congestion on these links where bus services run. Meanwhile, pedestrians and cyclists may be impacted by severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects at the B1168, Broad Drove East, B1165 Church Lane and B1165.

Operation

5.9.25 Based on the preliminary assessment, no likely significant effects are predicted for Traffic and Movement during operation.

Section 7

Construction

5.9.26 During construction in Section 7, drivers, bus passengers, pedestrians and cyclists may be impacted by increased construction traffic flows. For drivers, increased construction traffic flows may cause severance, changes in journey time, driver delay and highway safety effects on some sections of Lynn Road, West Drove North and the A17. Bus passengers may be impacted by delays due to congestion on these highway links where bus services run. Meanwhile, pedestrians and cyclists may be impacted by severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects on some sections of Lynn Road.

5.9.27 Furthermore, all road users of some highway links between Sutton Bridge/Wisbech and the New Walpole B Substation may be impacted by the movement of AILS and hazardous loads. This is due to the potential for road closures/diversions causing severance, delay and increased journey time during transportation of AILs. All users may also be impacted if a road traffic accident leads to Hazardous Load spill.

Operation

5.9.28 In Section 7, an adopted unsurfaced road providing a ‘cut-through’ link of the West Walton Jubilee Walk will be impacted by construction of the New Walpole B Substation with permanent closure or diversion of the road. Details have not been confirmed and will be discussed and agreed with the local highway authority. As a result, potential significant effects for pedestrian users of the route cannot be ruled out at this stage.

Conclusions

5.9.29 Overall, negative effects may be likely on drivers, bus passengers, pedestrians and cyclists across all sections due to increased construction traffic flows which may cause severance, changes in journey time, delays and highway safety effects during construction. No likely significant effects are identified for Traffic and Movement during operation, except for Section 7 where construction of the New Walpole B Substation will affect pedestrian users where permanent closure or diversion of an adopted unsurfaced road will be required.

5.10 Noise and Vibration

Scope and Study Area

5.10.1 The potential interaction between the Project and Noise and Vibration sensitive receptors is assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 10 Noise and Vibration**. The preliminary assessment covers the following effects on receptors during construction and operation of the Project:

i. construction noise;

ii. construction vibration on people within buildings;

iii. construction vibration on buildings and structures;

iv. construction traffic noise;

v. operational noise from proposed operational plant (e.g. transformers) within proposed new substations; and

vi. operational noise and vibration from substantial maintenance activities.

5.10.2 The Study Area for the preliminary assessment (carried out per Section) for Noise and Vibration consists of the draft Order Limits and an additional 1 km buffer.

Existing Baseline

5.10.3 A range of information sources have been used to identify the Noise and Vibration baseline, such as OS mapping and AddressBase Plus data and Defra strategic noise mapping.

5.10.4 The Project is located within predominantly rural areas. Therefore, many of the Noise Sensitive Receptors (NSR) within the Study Areas across each Section are isolated dwellings, farms and those located in small settlements. Assessed NSRs also include those located within several built-up areas and villages, at varying distances from the draft Order Limits. There are several Noise Important Areas (NIAs) within the Study

Areas for Section 1, Section 2 and Section 6. NIAs highlight the residential areas experiencing the highest 1 per cent of noise levels from road and rail sources in England.

5.10.5 The noise environment is expected to vary around each Section Study Area depending on the nature of the area. For example, close to noise sources, such as roads and railways and in built up areas, ambient noise levels are expected to be higher. Further away from road and rail sources and in rural areas, ambient and background noise levels would be expected to be lower.

5.10.6 The main sources of environmental noise within the various Study Area include a number of principal highways, railway lines, and traffic on local roads. In terms of industrial sources, the main source of noise is likely to be agricultural activity.

Mitigation

5.10.7 National Grid has included mitigation measures into the design of the Project to avoid sensitive receptors and reduce significant effects. Such measures include carefully choosing the locations of pylons and routes of overhead lines to avoid or minimise disturbance to receptors. Furthermore, the proposed overhead line system is a 'Triple Araucaria' conductor bundle which is regarded as practically quiet during both dry and wet weather conditions.

5.10.8 The control and management of environmental effects during construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects on Noise and Vibration. These include Best Practicable Means (BPM) measures and detailed construction noise and vibration assessments to be carried out by the contractor. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.10.9 Additional mitigation measures are not anticipated to be required in relation to Noise and Vibration effects.

Preliminary Assessment

5.10.10 The preliminary assessment of effects reported below takes into account the design and control mitigation measures previously described.

Section 1

Construction

5.10.11 Based on the preliminary assessment, no likely significant effects are predicted for Noise and Vibration during construction. This is principally due to the distance between proposed construction works and nearby NSR.

Operation

5.10.12 Based on the preliminary assessment, with appropriate standard noise mitigation measures incorporated in the design of the New Grimsby West Substation and application of mitigation measures in place as set out in the CoCP for periods of maintenance, no likely significant effects are predicted for Noise and Vibration during operation.

Section 2

Construction

5.10.13 Based on the preliminary assessment, three residential NSR and one non-residential NSR would potentially experience Noise and Vibration impacts from pylon construction, construction of access, and drainage, without mitigation. However, construction Noise and Vibration impacts may be reduced to levels which would not result in significant Noise and Vibration effects with specific mitigation measures in place in the form of BPM, as set out in the Preliminary CoCP. Therefore, no likely significant effects are predicted for Noise and Vibration during construction.

Operation

5.10.14 Based on the preliminary assessment, with appropriate standard noise mitigation measures incorporated in the design of the New Grimsby West Substation and application of mitigation measures in place as set out in the CoCP for periods of maintenance, no likely significant effects are predicted for Noise and Vibration during operation. While New Grimsby West Substation does not fall within Section 2, some NSR in Section 2 fall within the Study Area for operational noise effects from the proposed New Grimsby West Substation in Section 1.

Section 3

Construction

5.10.15 Based on the preliminary assessment, no likely significant effects are predicted for Noise and Vibration during construction. This is principally due to the distance between proposed construction works and nearby NSR.

Operation

5.10.16 Based on the preliminary assessment, no likely significant effects are predicted for Noise and Vibration during operation.

Section 4

Construction

5.10.17 Based on the preliminary assessment, five residential NSRs and one non-residential NSR would potentially experience Noise and Vibration impacts from pylon construction and overhead line stringing, without mitigation. However, construction noise and vibration impacts may be reduced to levels which would not result in significant Noise and Vibration effects with specific mitigation measures in place in the form of BPM, as set out in the Preliminary CoCP. Therefore, no likely significant effects are predicted for Noise and Vibration during construction.

Operation

5.10.18 Based on the preliminary assessment, no likely significant effects are predicted for Noise and Vibration during operation.

Section 5

Construction

5.10.19 Based on the preliminary assessment and currently available information on Section 5, no likely significant effects are predicted for Noise and Vibration during construction assuming the implementation of mitigation measures. It is noted that given the current uncertainty regarding the specific location of the new substation(s) in Section 5 that this assessment may be subject to change.

Operation

5.10.20 Based on the preliminary assessment, no likely significant effects are predicted for Noise and Vibration during operation.

Section 6

Construction

5.10.21 Based on the preliminary assessment, four residential NSR would potentially experience Noise and Vibration impacts from pylon construction, overhead line stringing, and drainage, without mitigation. However, construction Noise and Vibration impacts may be reduced to levels which would not result in significant Noise and Vibration effects with specific mitigation measures in place in the form of BPM, as set out in the Preliminary CoCP. Therefore, no likely significant effects are predicted for Noise and Vibration during construction.

Operation

5.10.22 Based on the preliminary assessment, no likely significant effects are predicted for Noise and Vibration during operation.

Section 7

Construction

5.10.23 Based on the preliminary assessment, two residential NSR would potentially experience Noise and Vibration impacts from the construction of the proposed construction compound, without mitigation. However, construction Noise and Vibration impacts may be reduced to levels which would not result in significant Noise and Vibration effects with specific mitigation measures in place in the form of BPM, as set out in the Preliminary CoCP. Therefore, no likely significant effects are predicted for Noise and Vibration during construction.

Operation

5.10.24 Based on the preliminary assessment, no likely significant effects are predicted for Noise and Vibration during operation.

Conclusions

5.10.25 Overall, a number of residential NRS would potentially experience Noise and Vibration impacts from the construction of the proposed construction compounds,

new substations, pylon construction, overhead line stringing, and drainage, without mitigation. However, with the implementation of specific mitigation measures in place in the form of BPM, as set out in the Preliminary CoCP, construction Noise and Vibration impacts may be reduced to levels which would not result in significant Noise and Vibration effects. Due to these measures no likely significant effects are predicted for Noise and Vibration across all sections.

5.11 Socio-economics, recreation and tourism

Scope and Study Area

5.11.1 The potential interaction between the Project and Socio-economics, recreation and tourism receptors is assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 11 Socio-economics, recreation and tourism** and **PEI Report Volume 2 Part C Route-wide Chapter 7 Socio-economics, recreation and tourism.** The preliminary assessment covers effects on the following receptors at a Section level during construction, operation and maintenance of the Project:

i. local businesses;

ii. development land;

iii. community facilities;

iv. open space;

v. users of Public Rights of Way (PRoW) and promoted/recreational routes; and

vi. aviation.

5.11.2 At a route-wide level, the preliminary assessment covers effects on the following receptors during construction, operation and maintenance of the Project:

i. Affected communities (local communities, including populations of towns and villages);

ii. Labour market (including employment, supply chain effects, training and apprenticeship opportunities, as well as any impact on tourism bedspace from the construction workforce); and

iii. Strategic visitor attractions.

5.11.3 The Study Area for the preliminary assessment (carried out per Section) varies for different Socio-economics, recreation and tourism receptors. These are:

i. within the draft Order Limits for direct effects on local businesses, development land, community facilities, open space, users of PRoW of local significance and promoted/recreational routes;

ii. within 500 m of the draft Order Limits for indirect effects on local businesses, development land, community facilities, open space, users of PRoW of local significance and promoted/recreational routes; and

iii. within 5 km of the proposed overhead line alignment for indirect effects on strategic visitor attractions and aviation.

Existing Baseline

5.11.4 A range of information sources have been used to identify the Socio-economics, recreation and tourism baseline, including OS data such as open greenspace, local important buildings and AddressBase, local authority local plans and frameworks, traffic count data from surveys, and designated non-motorised user routes and PRoWs from Sustrans.

5.11.5 Numerous community facilities and local businesses, including farms, local tourist attractions and tourist accommodation, fall within each Section Study Area. Open space, which includes all open space of public value, can take many forms, from formal sports pitches to open areas within a development, linear corridors and country parks. All Section Study Areas, with the exception of Section 7, contain open space.

5.11.6 There are numerous areas of development land within the various Study Areas which includes existing and proposed land used for above ground renewable energy generation (solar and onshore wind farms), alongside development land allocations set out in local planning policy.

5.11.7 Furthermore, the preliminary assessment considers people using PRoW for walking, wheeling, cycling and horse-riding. Promoted/recreational routes generally involve national cycle routes, the local cycle network, long-distance paths and national trails. There are various PRoWs and promoted/recreational routes within the various Study Areas.

5.11.8 Airfields and airstrips, operational or known to have been recently operational, which are located within 5 km of the proposed overhead line infrastructure, are included within the Study Area for Section 2, Section 4 and Section 6.

Mitigation

5.11.9 National Grid has included mitigation measures into the design of the Project to avoid sensitive receptors and reduce significant effects. Such measures include carefully choosing the locations of pylons and routes of overhead lines to avoid or minimise disturbance to receptors.

5.11.10 The control and management of environmental effects during construction of the Project would be managed by a CoCP (to include a PRoW Management Plan), which outlines measures to be implemented to reduce effects on Socio-economics, recreation and tourism. These include measures such as careful management of PRoW closures and diversions; construction working being undertaking within agreed working hours, reinstatement of land to its condition before construction (for example hedgerows, fences and walls reinstated to a similar style and quality) in consultation with the landowner, and any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance will be located away from sensitive receptors. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.11.11 Additional mitigation measures are not anticipated to be required in relation to Socio-economic, Recreation and Tourism effects.

Preliminary Assessment

5.11.12 The preliminary assessment of effects reported below takes into account the design and control mitigation measures previously described.

Section 1

Construction

5.11.13 Based on the preliminary assessment for Section 1, one local business is considered high sensitivity Healing Manor Hotel, due to its social and/or community value which would likely have limited potential for substitution in the immediate surrounding area. 7no. community facilities are considered to have high sensitivity; and 3no. promoted/recreational routes are considered to have high sensitivity, including Freshney Valley route which is located within the draft Order Limits.

5.11.14 Due to construction activities within Section 1, the North East Lincolnshire Local Plan Grimsby West Urban Extension Housing Allocation and the associated Proposed New Road on land west of Laceby Acres and Wybers Wood; the Central Lincolnshire Value Zone B, and Lincolnshire Minerals and Waste Local Plan Petroleum Exploration Development License Block may be impacted by permanent partial loss and/or local temporary loss of land.

5.11.15 At this stage, it has been assumed as a worst-case scenario approach that above ground renewable energy generation infrastructure (solar farms and onshore wind farms) that intercept with the draft Order limits will be directly impacted and would therefore have potential for likely significant effects due to potential temporary loss of land during construction. Section 1 includes the Aura Power Grimsby Solar Farm, which has recently been granted planning permission and is situated within the draft Order Limits. An assessment of the direct effects of the Project on above ground renewable energy generation infrastructure (solar and onshore wind farms) as socio-economic receptors will be presented in the ES.

Operation

5.11.16 Based on the preliminary assessment, no likely significant effects are predicted for Socio-economics, recreation and tourism during operation in relation to the majority of receptors.

5.11.17 Should the promoter of the allocated land under policy Grimsby West Housing Allocation within the North East Lincolnshire Local Plan bring forward proposals, the operational stage of the Project could lead to a change in the environment which may have an adverse impact on the amenity value of the future users of the land allocated for new housing development. National Grid and the promoter of the site are continuing to engage and an update will be provided at ES stage; there is currently an insufficient level of detail to inform an assessment of likely effects during operation and maintenance. Any ongoing engagement with the promoter will seek to better understand any potential mitigation to reduce the impact as far as possible and practicable. Any such measures will be reported within the ES.

5.11.18 As noted above, as a worst-case scenario approach, it has been assumed that solar and onshore wind farms that intercept with the draft Order limits will be directly impacted and would therefore have potential for likely significant effects due to potential permanent loss of land during operation.

Section 2

Construction

5.11.19 Based on the preliminary assessment for Section 2, local business including Laceby Manor – Spa and Golf Resort, and Fishing Lakes and Furze Farm Estate are considered to have a high sensitivity due to their social and/or community value which would likely have limited potential for substitution in the immediate surrounding area. North East Lincolnshire Local Plan allocates 4no. education areas and housing allocations which are considered to have a high sensitivity. 19no. community facilities are considered to have a high sensitivity. Three promoted/recreational routes including Greenwich Meridian Trial, Louth Canal, Silver Lincs Way and Wanderlust Way are all noted to have a high sensitivity and are located within the draft Order Limits.

5.11.20 While these receptors within this section are noted to have a high sensitivity, no likely significant effects for these receptors are predicted for Socio-economics, recreation and tourism during construction due to the implementation of mitigation measures to avoid and minimise effects on socio-economic receptors where possible, as noted in the mitigation measures above.

5.11.21 Three solar farms are located within the draft Order Limits (Yarburgh Grove Solar Farm, Laceby Solar Farm and Low Farm Solar Farm). Section 2 also includes Bradley Road Solar Farm which has recently been granted planning permission, situated within the draft Order Limits.

5.11.22 At this stage, it has been assumed as a worst-case scenario approach that above ground renewable energy generation infrastructure (solar farms and onshore wind farms) that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential temporary loss of land during construction. Solar farms within Section 2 includes Yarburgh Solar Farm, Laceby Solar Farm and Low Farm Solar Farm, amongst others. An assessment of the direct effects of the Project on above ground renewable energy generation infrastructure (solar and onshore wind farms) as socio-economic receptors will be presented in the ES.

Operation

5.11.23 Based on the preliminary assessment, no likely significant effects are predicted for Socio-economics, Recreation and Tourism during operation in relation to the majority of receptors.

5.11.24 There are seven aviation receptors within 5 km of the proposed overhead line infrastructure. A specialist aviation consultant has been engaged by National Grid to support ongoing discussions and analysis relating to the operational safety of airfields in the vicinity of the Project. The findings of this initial analysis have been used to inform routing and siting decisions as part of the development of the Project. Further engagement will be undertaken with airfield owners and operators as the Project progresses. A more detailed analysis of potential impacts on aviation receptors will be used to inform the Socio-economic, recreation and tourism assessment at ES stage.

5.11.25 As noted above, as a worst-case scenario approach, it has been assumed that solar and onshore wind farms that intercept with the draft Order Limits will be directly

impacted and would therefore have potential for likely significant effects due to potential permanent loss of land during operation.

Section 3

Construction

5.11.26 Based on the preliminary assessment for Section 3, East Lindsey District Council Adapted Local Zone Coastal Development Order is located within the draft Order Limits and has a high sensitivity; this Development Order is a planning tool used to streamline development processes in coastal areas. St Margaret's Church community facility is also considered to have high sensitivity, due to its social and/or community value which would likely have limited potential for substitution in the immediate surrounding area. While these receptors within this section are noted to have a high sensitivity, no likely significant effects for these receptors are predicted for Socio-economics, recreation and tourism during construction due to the implementation of mitigation measures to avoid and minimise effects on socio-economic receptors where possible, as noted in the mitigation measures above.

Operation

5.11.27 Based on the preliminary assessment, no likely significant effects are predicted for Socio-economics, recreation and tourism during operation.

Section 4

Construction

5.11.28 Based on the preliminary assessment for Section 4, local business including Herons Mead Caravan Park and Fishing Lakes, Castledyke Farm and Equestrian Centre, Appletree Holiday Park and Golf Course, and Boston West Hotel are considered to have a high sensitivity due to their social and/or community value which would likely have limited potential for substitution in the immediate surrounding area.

5.11.29 East Lindsey Local Plan includes sports and recreation allocation, Wigtoft and the South East Lincolnshire Local Plan includes recreational and green infrastructure allocations, and sand and gravel Minerals Safeguarding Areas which are considered to have a high sensitivity. Six community facilities are considered to have a high sensitivity. Five promoted/recreational routes including Cross Britain Way, Greenwich Meridian Trial, MacMillan Way, NCN 1 and Water Rail Way are all noted to have a high sensitivity.

5.11.30 While these receptors within this section are noted to have a high sensitivity, no likely significant effects for these receptors are predicted for Socio-economics, recreation and tourism during construction due to the implementation of mitigation measures to avoid and minimise effects on socio-economic receptors where possible, as noted in the mitigation measures above.

5.11.31 Two Solar farms are considered to have high sensitivity, including Nowhere Farm Solar Photo-Voltaic (PV) which is located immediately adjacent to the draft Order Limits; and Bicker Fen Solar PV. At this stage, it has been assumed as a worst-case scenario approach that above ground renewable energy generation infrastructure (solar farms and onshore wind farms) that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due

to potential temporary loss of land during construction. An assessment of the direct effects of the Project on above ground renewable energy generation infrastructure (solar and onshore wind farms) as socio-economic receptors will be presented in the ES.

Operation

5.11.32 Based on the preliminary assessment, no likely significant effects are predicted for Socio-economics, recreation and tourism during operation in relation to the majority of receptors.

5.11.33 There are six aviation receptors within 5 km of the proposed overhead line infrastructure. A specialist aviation consultant has been engaged by National Grid to support ongoing discussions and analysis relating to the operational safety of airfields in the vicinity of the Project. The findings of this initial analysis have been used to inform routing and siting decisions as part of the development of the Project. Further engagement will be undertaken with airfield owners and operators as the Project progresses. A more detailed analysis of potential impacts on aviation receptors will be used to inform the Socio-economic, recreation and tourism assessment at ES stage.

5.11.34 As noted above, as a worst-case scenario approach, it has been assumed that solar and onshore wind farms that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential permanent loss of land during operation.

Section 5

Construction

5.11.35 Based on the preliminary assessment for Section 5, South East Lincolnshire Local Plan includes four employment and housing allocations which are considered to have a high sensitivity, three community facilities are considered to have a high sensitivity and the MacMillan Way promoted/recreational route is noted to have a high sensitivity. While these receptors within this section are noted to have a high sensitivity, no likely significant effects for these receptors are predicted for Socio-economics, recreation and tourism during construction due to the implementation of mitigation measures to avoid and minimise effects on socio-economic receptors where possible, as noted in the mitigation measures above.

5.11.36 The Spalding PV and Battery Energy Storage System (BESS) project is a proposed development, situated partly within the Refined Siting Zone boundary, with a High sensitivity. At this stage, it has been assumed as a worst-case scenario approach that above ground renewable energy generation infrastructure (solar farms and onshore wind farms) that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential temporary loss of land during construction. An assessment of the direct effects of the Project on above ground renewable energy generation infrastructure (solar and onshore wind farms) as socio-economic receptors will be presented in the ES.

Operation

5.11.37 Based on the preliminary assessment, no likely significant effects are predicted for Socio-economics, recreation and tourism during operation.

5.11.38 There are six aviation receptors within 5 km of the proposed overhead line infrastructure. A specialist aviation consultant has been engaged by National Grid to support ongoing discussions and analysis relating to the operational safety of airfields in the vicinity of the Project. The findings of this initial analysis have been used to inform routing and siting decisions as part of the development of the Project. Further engagement will be undertaken with airfield owners and operators as the Project progresses. A more detailed analysis of potential impacts on aviation receptors will be used to inform the Socio-economic, recreation and tourism assessment at ES stage.

5.11.39 As noted above, as a worst-case scenario approach, it has been assumed that solar and onshore wind farms that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential permanent loss of land during operation.

Section 6

Construction

5.11.40 Based on the preliminary assessment for Section 6, the South East Lincolnshire Local Plan includes housing allocations and proposed residential gypsy/traveller sites which are considered to have a high sensitivity, eight community facilities and the Tydd St Giles Golf and Country Club local business are considered to have a high sensitivity, and promoted/recreational routes including Greenwich Meridian Trial, National Cycle Route 1 and Nene Way are all noted to have a high sensitivity. While these receptors within this Section are noted to have a high sensitivity, no likely significant effects for these receptors are predicted for Socio-economics, recreation and tourism during construction due to the implementation of mitigation measures to avoid and minimise effects on socio-economic receptors where possible, as noted in the mitigation measures above.

5.11.41 Grange Farm Solar Site is located within and three solar farms are proposed within the Section Study Area (At this stage, it has been assumed as a worst-case scenario approach that above ground renewable energy generation infrastructure (solar farms and onshore wind farms) that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential temporary loss of land during construction. An assessment of the direct effects of the Project on above ground renewable energy generation infrastructure (solar and onshore wind farms) as socio-economic receptors will be presented in the ES.

Operation

5.11.42 Based on the preliminary assessment, no likely significant effects are predicted for Socio-economics, recreation and tourism during operation in relation to the majority of receptors.

5.11.43 There is one aviation receptor (Fenland Airfield) within 5 km of the proposed overhead line infrastructure. A specialist aviation consultant has been engaged by National Grid to support ongoing discussions and analysis relating to the operational safety of airfields in the vicinity of the Project. The findings of this initial analysis have been used to inform routing and siting decisions as part of the development of the Project. Further engagement will be undertaken with airfield owners and operators as the Project progresses. A more detailed analysis of potential impacts on aviation

receptors will be used to inform the Socio-economic, recreation and tourism assessment at ES stage.

5.11.44 As noted above, as a worst-case scenario approach, it has been assumed that solar and onshore wind farms that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential permanent loss of land during operation.

Section 7

Construction

5.11.45 Based on the preliminary assessment for Section 7, Walton Club community facility is considered to have a high sensitivity due to its social and/or community value which would likely have limited potential for substitution in the immediate surrounding area. Promoted/recreational routes including the National Cycle Route 1 and the West Walton Jubilee Walk are also considered to have a high sensitivity. While these receptors are noted to have a high sensitivity, no likely significant effects for these receptors are predicted for Socio-economics, recreation and tourism during construction due to the implementation of mitigation measures to avoid and minimise effects on socio-economic receptors where possible, as noted in the mitigation measures above.

5.11.46 Four solar farms are located within this Section Study Area. At this stage, it has been assumed as a worst-case scenario approach that above ground renewable energy generation infrastructure (solar farms and onshore wind farms) that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential temporary loss of land during construction. There is one receptor in Section 7 that is located within the draft Order Limits, Rose and Crown Solar Farm. Other receptors within Section 7 and within 500m of the draft Order Limits include Walpole Bank Solar Site, Sutton Bridge Solar Farm, Gunthorpe Road Solar Site and Wind Turbine along West Drove North. An assessment of the direct effects of the Project on above ground renewable energy generation infrastructure (solar and onshore wind farms) as socio-economic receptors will be presented in the ES.

Operation

5.11.47 Based on the preliminary assessment, no likely significant effects are predicted for Socio-economics, recreation and tourism during operation in relation to the majority of receptors.

5.11.48 As noted above, as a worst-case scenario approach, it has been assumed that solar and onshore wind farms that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential permanent loss of land during operation.

Summary of route-wide effects

Affected communities

5.11.49 During construction, it is acknowledged that there may be impacts for affected communities by way of traffic, plant and machinery and erection of the overhead lines, new substations and associated works. This may cause access, dust, noise

and vibration effects as considered in other environmental topic chapters in **PEI Report Volume 2 Part B** (please see **Chapter 9 Traffic and Movement**, **Chapter 3 Visual**, **Chapter 10 Noise and Vibration**, and **Chapter 12 Air Quality**) and **PEI Report Volume 2 Part C Route-wide Chapter 10 Health and Wellbeing**. Indirect effects including those relating to amenity will be monitored and managed through the Construction Environmental Management Plan (CEMP), CTMP, and appropriate management will reduce the potential for significant effects.

Labour market

5.11.50 Based on preliminary information, approximately 424 FTE additional construction workers per year are estimated during the five year capital expenditure programme for construction (2029-2033) as a local direct net effect. The direct construction employment generated by the Project is likely to have a potential minor positive and temporary effect on the economy, which is not considered to be significant.

5.11.51 Detail relating to the supply chain, training and skills is not currently available. An assessment of potential impacts upon these topics will be undertaken at ES stage, subject to the relevant information being available from National Grid. At this stage, it is anticipated that the Project will create beneficial training and apprenticeship opportunities both on-site and indirectly in the supply chain.

5.11.52 Overall, both temporary positive benefits to tourist accommodation businesses and temporary adverse effects through a reduction in tourist accommodation bed spaces are anticipated in relation to the labour market during construction. Given the preliminary number of construction workers anticipated to be employed on the Project, and the level of likely spare capacity for bedspace, the effects are not likely to be significant.

Strategic visitor attractions

5.11.53 There is the potential for indirect, temporary effects to arise from construction activities (noise and vibration, air quality and dust, transport and movement and visual impacts), although these are not expected to be significant due to the distance of these receptors from the construction activities (with the closest receptor approximately 2 km and the remainder approximately 3-4 km from the draft Order Limits) and on the basis that access to these attractions would be maintained at all times

Conclusions

5.11.54 Based upon the preliminary assessment, no significant effects are predicted upon Socio-economics, recreation and tourism receptors route-wide, as a result of the construction phase of the Project.

5.11.55 Overall, although a number of high sensitivity Socio-economics, recreation and tourism receptors exist across all Sections, no likely significant effects are predicted for these receptors, due to the implementation of mitigation measures to avoid and minimise effects on socio-economic receptors as noted in the sections above. This is with the exception of above ground renewable energy generation (solar farms and onshore wind farms), where at this preliminary stage, it has been assumed as a ‘worst-case’ scenario approach that solar farms that intercept with the draft Order Limits will be directly impacted and would therefore have potential for likely significant effects due to potential temporary or permanent loss of land during construction or

operation. An assessment of the direct effects of the Project on above ground renewable energy generation infrastructure (solar and onshore wind farms) as socio-economic receptors will be presented in the ES.

5.12 Air Quality

Scope and Study Area

5.12.1 The potential interaction between the Project and Air Quality is assessed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 12 Air Quality**. The preliminary assessment covers the following effects on receptors during construction and operation of the Project:

i. dust during construction on sensitive human and ecological receptors, of which the main potential impacts are dust soiling and deterioration of human health; and

ii. vehicular tail-pipe emissions containing air pollutants released by construction, operation and maintenance.

5.12.2 The Study Area for the preliminary assessment (carried out per Section) varies for different Air Quality receptors. For the construction dust assessment, these are:

i. human receptors within the draft Order Limits (or the Refined Siting Zone boundary, as appropriate), plus those up to 250 m from the draft Order Limits (or the Refined Siting Zone boundary), those within 50 m of the proposed routes used by construction traffic on the public highway, and those up to 250 m from a site entrance; and

ii. ecological designated sites within the draft Order Limits (or the Refined Siting Zone boundary), plus those up to 200 m from the draft Order Limits (or the Refined Siting Zone boundary), those within 50 m of the proposed routes used by construction traffic on the public highway, and those up to 250 m from a site entrance.

5.12.3 For the assessment of road traffic emissions, the Study Areas are:

i. any road where the change in road traffic exceeds the criteria given in the Environmental Protection UK (EPUK)/Institute for Air Quality Management (IAQM) guidance is exceeded, and any human sensitive receptors within 200 m of these roads; and

ii. any ecological sensitive receptors within 200 m of any road links where the projected changes in traffic flow exceed the IAQM guidance thresholds.

Existing Baseline

5.12.4 The existing Air Quality baseline across the Project has been informed by an assessment of likely background concentrations of Nitrogen Oxides (NOx), Nitrogen Dioxide (NO_2), and Particulate Matter (PM_{10} and $PM_{2.5}$) taken from Defra modelled data, and a review of available local authority monitoring data within 200 m of construction routes. Overall, Air Quality is good reflecting the rural nature of the Study Area.

5.12.5 There are seven Air Quality Management Areas (AQMAs) within the administrative areas of Boston Borough Council, Fenland District Council and King's Lynn and West Norfolk Borough Council. Except for three of the AQMAs declared by Fenland District Council, these have declared due to exceedances of the annual mean NO_2 Air Quality Objective. Levels of NO_2 within the AQMAs, which predominantly cover roads within urban areas away from the draft Order Limits (or the Refined Siting Zone boundary in the case of section 5) but which could be used by construction traffic, are, on the whole, below the annual mean Air Quality Objective for NO_2.

5.12.6 Human sensitive receptors are located within the Study Area across all Sections. Many of these are located in settlements within or in close proximity to the draft Order Limits, but receptors also include individual scattered properties within the wider rural area. These properties include those located in several small hamlets and individual agricultural holdings. Statutory designated ecological sites within the various Study Areas include a number of LNRs including Bradley and Dixon's Woods, Hornby/Mother Woods Ancient Woodland and Willoughby Branch Line. Non-statutory designated sites such as LWS and CWS are also present within the various Study Areas.

Mitigation

5.12.7 National Grid has included mitigation measures into the design of the Project to avoid sensitive receptors and reduce significant effects. Such measures include carefully choosing the locations of pylons and routes of overhead lines to avoid or minimise disturbance to designated sites. Other considerations have been made when routeing construction haul roads and ensuring appropriate working distances from notable or protected habitats.

5.12.8 The control and management of environmental effects during construction of the Project would be managed by a CoCP, this outlines proportionate measures to be implemented to reduce effects on amenity, due to dust soiling, and human health, in terms of PM_{10}, and which includes emission standards for vehicles and plant. These mitigation measures have been determined through the preliminary assessment. The Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**. Other measures included in the Project's design that would also minimise dust impacts include screening vegetation, tree planting and woodland replacement.

5.12.9 Additional Air Quality monitoring beyond on-site and off-site visual inspections are not anticipated to be required.

Preliminary Assessment

5.12.10 The preliminary assessment of effects reported below takes into account the design and control mitigation measures previously described.

Section 1

Construction

5.12.11 Based on the preliminary assessment, following implementation of dust mitigation measures outlined in the CoCP, it is not considered likely that there would be significant effects associated with dust and PM_{10} generated during construction.

5.12.12 Projected changes in traffic flows exceed the EPUK/IAQM screening criteria for human sensitive receptors and the IAQM screening criteria for ecological sensitive receptors due to increased construction traffic flows on 12 road links. Therefore, significant effects due to changes in Air Quality cannot be ruled out at this stage and will require further assessment within the ES.

Operation

5.12.13 Based on the preliminary assessment, no likely significant effects are predicted for Air Quality during operation.

Section 2

Construction

5.12.14 Based on the preliminary assessment, following implementation of dust mitigation measures outlined in the CoCP, it is not considered likely that there would be significant effects associated with dust and PM_{10} generated during construction.

5.12.15 Projected changes in traffic flows exceed the EPUK/IAQM screening criteria for human sensitive receptors and the IAQM screening criteria for ecological sensitive receptors due to increased construction traffic flows on 31 road links. Therefore, significant effects due to changes in Air Quality cannot be ruled out at this stage and will require further assessment within the ES.

Operation

5.12.16 Based on the preliminary assessment, no likely significant effects are predicted for Air Quality during operation.

Section 3

Construction

5.12.17 Based on the preliminary assessment, following implementation of dust mitigation measures outlined in the CoCP, it is not considered likely that there would be significant effects associated with dust generated during construction.

5.12.18 Projected changes in traffic flows exceed the EPUK/IAQM screening criteria for human sensitive receptors and the IAQM screening criteria for ecological sensitive receptors due to increased construction traffic flows on 19 road links. Therefore, significant effects due to changes in Air Quality cannot be ruled out at this stage and will require further assessment within the ES.

Operation

5.12.19 Based on the preliminary assessment, no likely significant effects are predicted for Air Quality during operation.

Section 4

Construction

5.12.20 Based on the preliminary assessment, following implementation of dust mitigation measures outlined in the CoCP, it is not considered likely that there would be significant effects associated with dust generated during construction.

5.12.21 Projected changes in traffic flows exceed the EPUK/IAQM screening criteria for human sensitive receptors and the IAQM screening criteria for ecological sensitive receptors due to increased construction traffic flows on 36 road links. Therefore, significant effects due to changes in Air Quality cannot be ruled out at this stage and will require further assessment within the ES.

Operation

5.12.22 Based on the preliminary assessment, no likely significant effects are predicted for Air Quality during operation.

Section 5

Construction

5.12.23 Based on the preliminary assessment, following implementation of dust mitigation measures outlined in the CoCP, it is not considered likely that there would be significant effects associated with dust generated during construction.

5.12.24 Projected changes in traffic flows exceed the EPUK/IAQM screening criteria for human sensitive receptors and the IAQM screening criteria for ecological sensitive receptors due to increased construction traffic flows on 11 road links. Therefore, significant effects due to changes in Air Quality cannot be ruled out at this stage and will require further assessment within the ES.

Operation

5.12.25 Based on the preliminary assessment and information known to date, no likely significant effects are predicted for Air Quality during operation. Given current uncertainty regarding the specific location of the new Weston Marsh substation(s) and connecting transmission infrastructure, this preliminary assessment may be subject to change and updated for ES.

Section 6

Construction

5.12.26 Based on the preliminary assessment, following implementation of dust mitigation measures outlined in the CoCP, it is not considered likely that there would be significant effects associated with dust generated during construction.

5.12.27 Projected changes in traffic flows exceed the EPUK/IAQM screening criteria for human sensitive receptors and the IAQM screening criteria for ecological sensitive receptors due to increased construction traffic flows on 17 road links. Therefore, significant effects due to changes in Air Quality cannot be ruled out at this stage and will require further assessment within the ES.

Operation

5.12.28 Based on the preliminary assessment, no likely significant effects are predicted for Air Quality during operation.

Section 7

Construction

5.12.29 Based on the preliminary assessment, following implementation of dust mitigation measures outlined in the CoCP, it is not considered likely that there would be significant effects associated with dust generated during construction.

5.12.30 Projected changes in traffic flows exceed the EPUK/IAQM screening criteria for human sensitive receptors and the IAQM screening criteria for ecological sensitive receptors due to increased construction traffic flows on four road links. Therefore, significant effects due to changes in Air Quality cannot be ruled out at this stage and will require further assessment within the ES.

Operation

5.12.31 Based on the preliminary assessment, no likely significant effects are predicted for Air Quality during operation.

Conclusions

5.12.32 Following implementation of dust mitigation measures outlined in the CoCP, it is not considered likely that there would be significant effects associated with dust generated during construction.

5.12.33 A number of road links are expected to exceed the EPUK/IAQM criteria for human sensitive receptors and the IAQM criteria for ecological sensitive receptors due to increased construction traffic flows. These road links will require further assessment within the ES.

5.13 Health and Wellbeing

5.13.1 The preliminary assessment for Health and Wellbeing was undertaken at a route-wide level at a geographic scale greater than the route Sections, where the nature of the effect is such that they are geographically widespread.

Scope and Study Area

5.13.2 The potential interaction between the Project and human health receptors is assessed in **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing**.

5.13.3 The scope of the construction assessment covers potential impacts upon the following:

i. employment;

ii. neighbourhood quality;

iii. access to promoted/recreational routes and open spaces; and

iv. access to healthcare and social infrastructure.

5.13.4 The scope of the operation assessment covers potential impacts upon the following:

i. neighbourhood quality;

ii. mental health effects of electro-magnetic fields (EMF);

iii. access to healthcare and social infrastructure; and

iv. access to promoted/recreational routes and open spaces.

5.13.5 The Study Area for the health and wellbeing assessment differs based on the receptor. For the preliminary assessment, the Study Area comprises electoral wards in which the Project is located and residential, community and healthcare facilities and open spaces within 500 m of the draft Order Limits.

Existing Baseline

5.13.6 A range of data sources were used to inform the baseline conditions across the Project, including the Office of National Statistics (ONS), population surveys, and data from Public Heath England.

5.13.7 Across the Project as a whole, there is a high number of residents aged 65 and older compared to national averages, with a lower proportion of people aged 16-64. Unemployment profiles do not differ significantly across the Project Study Area, however Sections 1 and 2 have slightly higher rates of unemployment compared to the remaining Sections. Local health data suggests there are generally higher instances of people reporting bad-health when compared to the national average across the Study Area, notably in Section 4. All Sections report wellbeing related to anxiety, happiness, life satisfaction, and worthwhile indicators in line with the national average.

Mitigation

5.13.8 National Grid has included mitigation measures into the design of the Project to avoid sensitive receptors and reduce significant effects on health and wellbeing. Such measures include carefully choosing the locations of pylons and routes of overhead lines to avoid areas of high amenity, taking advantage of natural screening provided by existing woodland and landform, keeping visual, noise and other environmental effects to a minimum.

5.13.9 The control and management of environmental effects during construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects on health and wellbeing. These include measures such as training for construction workers, management of environmental effects (e.g. pollution), active community liaison and management of construction hours. A Preliminary CoCP is included as **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP**.

5.13.10 Additional mitigation measures which may be required as well as those listed above may include those that are set out in relation to visual, noise and vibration or transport, to further reduce impacts on neighbourhood quality.

Preliminary Assessment

Construction

5.13.11 Based on the preliminary assessment, no significant effects are anticipated during construction of the Project on employment, neighbourhood quality, or access to promoted/recreational routes and open spaces.

5.13.12 There is potential for temporary or permanent changes in access to healthcare and social infrastructure due to construction Traffic and Movement associated with the Project. Sections 4 and 6 have a number of health and social infrastructure receptors which could be impacted by these changes in access. It is noted that the Traffic and Movement assessment of potential routes which may be subject to significant effects is ongoing, therefore a full assessment could not be done when writing the PEI Report. The detailed assessment will be presented in the ES.

Operation

5.13.13 Based on the preliminary assessment, no significant effects upon people's health or wellbeing are anticipated during the operational phase of the Project.

5.14 Climate Change

5.14.1 The preliminary assessment for climate change was undertaken at a route-wide level at a geographic scale greater than the route Sections, where the nature of the effect is such that they are geographically widespread, meaning a route-wide assessment is more appropriate.

Scope and Study Area

5.14.2 The potential interaction between the Project and climate change is assessed in **PEI Report Volume 2 Part C Route-wide Chapter 9 Climate Change.** The chapter specifically addresses two separate aspects:

i. the greenhouse gas (GHG) assessment considers the effect on the climate of GHG emissions arising from the Project, including how the Project would affect the ability of government to meet its carbon reduction plan targets. At this early stage of design for the Project, information is insufficient to allow any calculations of emissions and therefore a detailed GHG assessment has not been undertaken at this stage. The PEI Report presents a qualitative appraisal of likely significance, and the detailed assessment will accompany the ES; and

ii. the in-combination climate change impact (ICCI) assessment considers where the future changed climate may increase environmental impacts from the Project on all environmental receptors, beyond those impacts arising from present climate conditions. The ICCI assessment is not included at this stage and will be undertaken at the ES stage after the likely significant environmental effects and their associated magnitudes have been identified within the other topic chapters within the ES.

5.14.3 The Study Area for the preliminary GHG assessment includes the whole spatial extent of the Project.

5.14.4 The Study Area for the ICCI assessment (to be reported in the ES) will be defined by the Study Areas used by each environmental discipline in their technical assessments.

Existing Baseline

5.14.5 The existing baseline for the GHG assessment is predominantly made up of emissions associated with arable land, hedgerows and trees. As the land use is mainly arable, there are nominal GHG emissions which are associated with land management (including fuel use for machinery use) and the soil types/vegetation present. The Project also runs through an area of peaty soils (peatland) for a distance of approximately 13 km, and would require approximately 40 pylons to be constructed within the peatland. Peatland ecosystems are capable of absorbing and storing large amounts of carbon dioxide and are considered valuable natural carbon sinks. At the time of writing the PEI Report, the existing baseline is considered as zero GHG emissions, being a worst realistic case for comparison using a precautionary approach. This will be reviewed for the ES.

5.14.6 For the ICCI assessment, existing and future baseline climate conditions will be reported in the ES, where the outcome of the ICCI assessment will be reported.

Mitigation

5.14.7 In terms of mitigating GHG emissions from the Project, National Grid has included mitigation measures into the design of the Project to avoid sensitive receptors and reduce the Project's impact on climate change. This is in accordance with National Grid's Holford Rules[13] and Horlock Rules[14] which apply to the design of overhead lines and new substations. Such measures include choosing overhead lines rather than underground cables which is beneficial for GHG emissions associated with the use of materials, construction, maintenance, repair and future upgrading. Consideration was also given to the presence of peaty soils, with an aim to avoid siting infrastructure within these areas where possible. Other measures may include circular economy principles[15], measures to reduce energy consumption, and recycling materials.

5.14.8 The control and management of environmental effects during construction of the Project would be managed by a CoCP, which outlines measures to be implemented to reduce effects on the climate. These include measures such as a carbon efficiency plan, retention of vegetation and reinstatement of peaty soils if affected.

5.14.9 At this stage of preliminary assessment, no additional mitigation measures in addition to those listed above are expected to be required.

5.14.10 Any additional required design, control and mitigation measures identified as a result of the ICCI assessment will be reported in the Climate Change chapter of the ES and measures would be incorporated into the relevant control documents.

[13] National Grid; Holford Rules [online]. Available at: https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf

[14] National Grid; Horlock Rules [online]. Available at: https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf

[15] Circular economy principles prioritise the reuse of materials, avoiding the over extraction of natural resources and the number of usable materials that end up in landfill.

Preliminary Assessment

Construction and operation

5.14.11 The Project is a crucial part of the Great Grid Upgrade, which is important for reaching the UK's goal of net zero carbon emissions by 2050. It will enable more clean energy sources, like wind and solar, be used instead of fossil fuels. Without the Project, it would be harder to get clean electricity to where it is needed. Based on this, it is considered that the GHG emissions created from the construction and operation of the Project would be insignificant compared to the likely emissions that would arise if the Project did not happen. A calculation of the GHG emissions anticipated to be generated or avoided by the Project will be included in the ES, which will also report the complete assessment of significance of effects.

5.14.12 The ICCI assessment will be reported in the Climate Change chapter of the ES after the likely effects have been identified by each environmental discipline.

5.15 Cumulative Effects

5.15.1 As described in **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects**, there are two types of cumulative effects, which are:

i. Intra-project cumulative effects: which 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 and air quality, leading to a greater overall effect on them.

ii. Inter-project cumulative effects: which occur where the effects of the Project interact with the effects of other developments in the area to generate a greater overall effect.

Intra-project cumulative effects

5.15.2 As the PEI Report presents a preliminary assessment and some topics are unable to confirm the level of effect, an assessment of intra-project cumulative effects has not been undertaken at this time. However, a pre-screening exercise has been undertaken to identify where a receptor is exposed to more than one type of effect. This is presented in **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects**.

5.15.3 Once information is available on the significance of effects within each assessment, a review will be undertaken to identify whether there may be any potentially significant intra-project cumulative effects across the Project. This will be presented in the ES which will be submitted alongside the application for development consent.

Inter-project cumulative effects

5.15.4 The preliminary assessment of inter-project cumulative effects is carried out in four key stages:

i. 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 effects which interact with those of the Project;

ii. 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;

iii. Step 3: Gather information available on the shortlisted developments;

iv. Step 4: Assess the likely significant cumulative effects of the shortlisted developments with the Project.

5.15.5 For the Stage 2 consultation, Stages 1 and 2 have been completed and are reported in the PEI Report in Volume 2 Part C. Stages 3 and 4 will be undertaken and the findings of these will be presented in the ES.

5.15.6 The PEI Report presents an initial screening exercise on relevant developments. A total of 51 developments have been shortlisted and are proposed to be taken forward into Stages 3 and 4 of the cumulative 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 ES.

6.1.3 National Grid expects to submit its DCO application for the Project in summer 2027, which will be accompanied by the ES, which will report the findings of the EIA process.

6.2 Where Can I Find Further Information?

6.2.1 This document is a non-technical summary of the PEI Report for the proposed Grimsby to Walpole Project. The PEI Report Volumes 1, 2, and 3 provide more detailed and technical information which is available on the Project website:

https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/grimsby-to-walpole

6.2.2 Further information can also be obtained:

i. Via email: contact@g-w.nationalgrid.com

ii. Telephone: 0808 258 4395 (lines are open Monday to Friday, 9:00 AM-5:30 PM)

6.2.3 Public information events will also take place as follows:

Table 6.1 Details of 2025 in-person information events

Date and Time	Venue
Wednesday 18 June 2pm - 7pm	Burgh Le Marsh Village Hall
Friday 20 June 1pm - 7pm	Pavilion Louth
Tuesday 24 June 2025 1pm – 7pm	Holton Le Clay Village Hall
Wednesday 25 June 1pm - 7pm	Alvingham Village Hall
Friday 27 June	Huttoft Village Hall

Date and Time	Venue
1pm - 7pm	
Saturday 28 June 11am - 4pm	Alford Corn Exchange
Wednesday 2 July 1 - 7pm	Eastville, Midville and New Leake Village Hall
Tuesday 8 July 1pm - 7pm	Hubberts Bridge Community Centre
Thursday 10 July 1pm - 7pm	Weston Village Hall
Wednesday 16 July 1pm - 7pm	Humber Royal Hotel
Friday 18 July 1pm – 7pm	Walpole Community Centre
Saturday 19 July 11am – 4pm	Tydd St Giles Community Centre

6.2.4 In addition to the in-person events as detailed in **Table 6.1**, five public online webinars will take place over the statutory consultation period. Information on how to sign up for these events can be found on National Grid's website for the Project. The dates for the webinars are presented in **Table 6.2** below.

Table 6.2 Public online webinars

Date and Time	Topic
Monday 23 June 2025 6.30pm – 7.30pm	General – overview of proposals
Thursday 26 June 2025 6.30pm – 7.30pm	Route Section 5 and 6 and 7
Monday 30 June 2025 6.30pm – 7.30pm	Route Sections 1 and 2
Monday 14 July 2025 6.30pm – 7.30pm	Route Section 3 and 4
Monday 21 July 2025 2pm – 3pm	General - overview of proposals

6.2.5 Printed copies of the Community newsletter, Feedback form, and the Stage 2 consultation document are available free of charge on National Grid's website for the

Project, at public information events and at local information points (where key documents will be available). Reference-only copies of this NTS, Design Development Report and a copy of the Statement of community consultation will also be available to view at local information points and on our Project website. The location of these points are presented in **Table 6.3** below.

Table 6.3 Details of information points (2025)

Local Information Points	Opening times
Cleethorpes Library, Alexandra Road, Cleethorpes, DN35 8LG	Monday – Thursday – 8:30am-5:30pm Friday – Closed Saturday – 9am-1pm Sunday - Closed
Waltham Library High Street, Waltham, Grimsby DN37 0LL	Monday – Closed Tuesday–Friday – 8:30am–12:30pm and 1:30pm–5:30pm Saturday – 9am–1pm Sunday – Closed
Louth Library Northgate, Louth LN11 0LY	Monday, Wednesday and Friday – 9am–5pm Tuesday – 9am–6pm Thursday – 9am–2pm Saturday – 9am–4pm Sunday – Closed
Burgh le Marsh Library and Community Hub Tinkers Green, Jacksons Lane, Burgh le Marsh, Skegness PE24 5LA	Monday, Wednesday and Friday – Closed Tuesday – 2pm–4pm Thursday and Saturday – 10am–1pm Sunday – Closed
Skegness Library 23 Roman Bank, Skegness PE25 2SA	Monday, Tuesday, Wednesday and Friday – 9am–5pm Thursday – 9am–6pm Saturday – 9am–1pm Sunday – Closed
Boston Library County Hall (Bank Street entrance), Boston PE21 6DY	Monday, Tuesday, Wednesday and Friday – 9am–5pm Thursday – 9am–6pm Saturday – 9am–1pm Sunday – Closed
Spalding Library Victoria Street, Spalding PE11 1EA	Monday, Tuesday, Wednesday and Friday – 9am–5pm Thursday – 9am–6pm Saturday – 9am–1pm Sunday – Closed
Holbeach Community Library	Monday–Friday – 9am–5pm

Local Information Points	Opening times
Co-Op Store, 5 Fleet Street, Holbeach, Spalding PE12 7AX	Saturday – 9am–12pm Sunday – Closed.
Long Sutton Library Trafalgar Square, Long Sutton, Spalding PE12 9HB	Monday and Thursday – 2pm–6pm Tuesday and Friday – 10am–5pm Wednesday – Closed Saturday – 10am–1pm Sunday – Closed
Wisbech Library Ely Place, Wisbech PE13 1EU	Monday – 9:30am–1pm Tuesday – 9:30am–7pm Wednesday, Thursday and Friday – 9:30am–5pm Saturday – 9:30am–4pm Sunday – Closed
King's Lynn Library London Road, King's Lynn PE30 5EZ	Monday–Friday – 8am–7pm Saturday – 8am-4pm Sunday – 10am–4pm
Sutton Bridge Community Library, Curlew Centre Bridge Road, Sutton Bridge, Spalding PE12 9SA	Monday, Friday and Saturday – 10am-12pm Wednesday – 2pm-4pm Tuesday, Thursday and Sunday - closed
Walpole Community Centre Summer Close, Wisbech, PE14 7JW	For opening hours, please contact the venue.

6.3 How Can I Have My Say?

6.3.1 National Grid want to hear your views on the proposals for Grimsby to Walpole. You can get in touch in the following ways:

i. Complete the feedback questionnaire online via the Project website: nationalgrid.com/g-w;

ii. Providing feedback by email (contact@g-w.nationalgrid.com); or

iii. completing a paper feedback form available at public information events, local information points or online. The feedback form can be returned free of charge using the Freepost address FREEPOST G TO W (no stamp required).

6.3.2 Comments received via any other method than those listed above may not be formally recorded as part of the consultation.

6.3.3 Comments given orally, such as via telephone on 0808 258 4395 or at public events will only 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 submitted by 6 August 2025. Feedback submissions sent via post will be accepted for up-to five working days after this date.

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 Responses may also be made public as part of the consultation report submitted as part of the DCO application.

6.3.7 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.

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