The Great Grid Upgrade

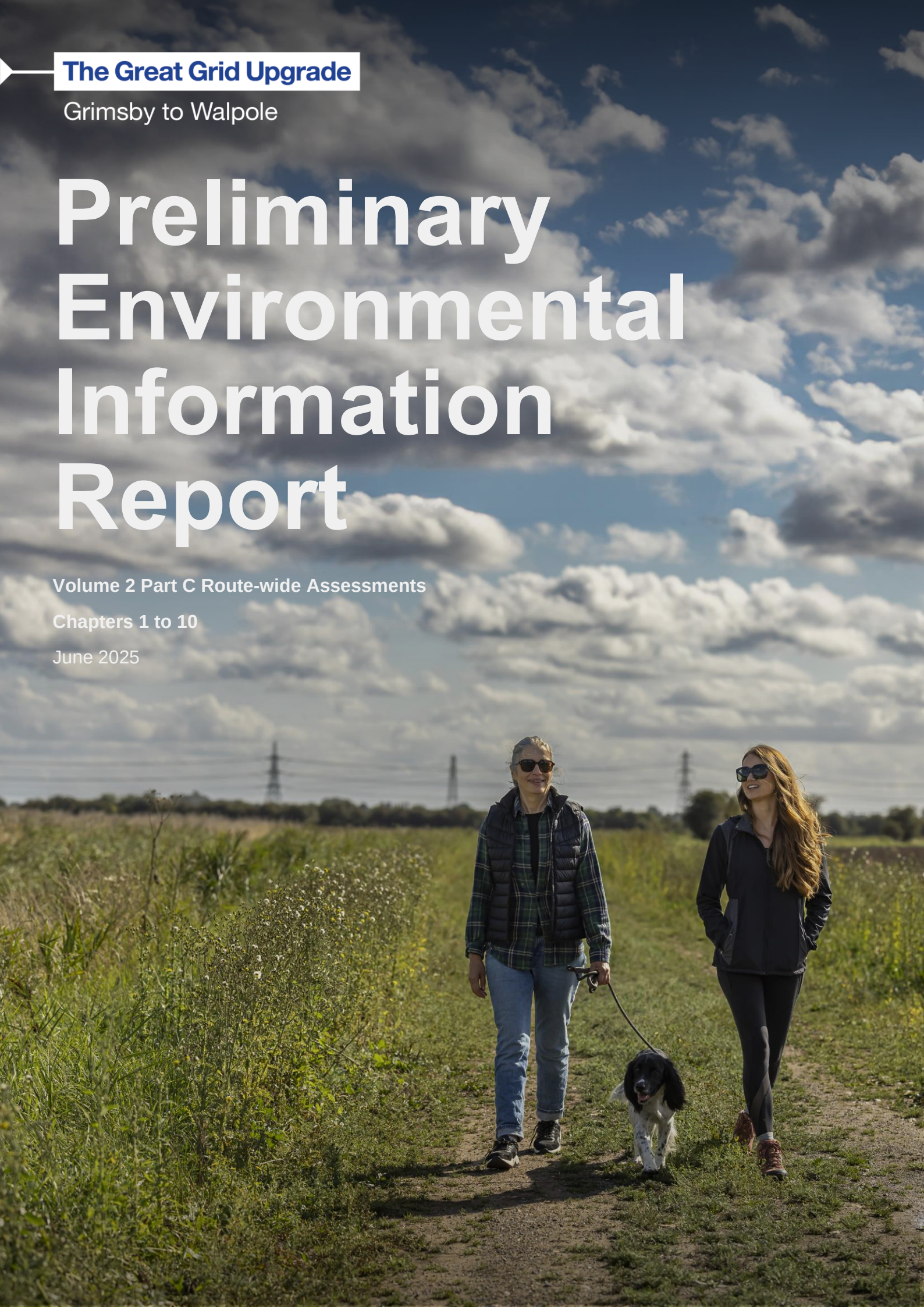
Grimsby to Walpole

Preliminary Environmental Information Report

Volume 2 Part C Route-wide Assessments

Chapters 1 to 10

June 2025



Contents

Grimsby to Walpole
Document control

Document Properties	
Organisation	Arup AECOM
Approved by	National Grid
Title	Preliminary Environmental Information Report Volume 2 Part C Route-wide Assessments Chapters 1 to 10
Document Register ID	GWNC-ARUP(AEC)-ENV-REP-0002
Data Classification	Public

Version History

Date	Version	Status	Description / Changes
June 2025	1.0	Final	First Issue

Preface

nationalgrid

Contents

1. Part C Preface

1.1 Structure and Context of the Preliminary Environmental Information (PEI) Report

1.1.1 This **Preliminary Environmental Information (PEI) Report Volume 2 Part C** is part of the wider suite of documents that make up the PEI Report for the Grimsby to Walpole Project (the Project), prepared by Ove Arup and Partners Ltd and AECOM Ltd, on behalf of National Grid Electricity Transmission plc (National Grid). The purpose of this PEI Report is to give consultees an understanding of the potential likely significant environmental effects (positive or negative) of the Project to enable them to prepare well-informed responses to the statutory consultation. This PEI Report has been prepared in accordance with the Planning Inspectorate (PINS) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements (Ref 1).

1.1.2 The proposal by National Grid is to reinforce the transmission network with a new 400 kilovolt (kV) electricity transmission line over a distance of approximately 140 kilometres (km) starting from a new 400 kV substation west of the town of Grimsby in North East Lincolnshire and ending at a new 400 kV substation west of the village of Walpole St Andrew and north of the town of Wisbech, in King's Lynn and West Norfolk District. The Project also includes the construction of two new 400 kV Lincolnshire Connection Substations located south-west of Mablethorpe in East Lindsey, up to two new 400 kV substations in the vicinity of the Spalding Tee-Point in South Holland District and the decommissioning (in full or part) of the existing Grimsby West Substation.

1.1.3 The Project is a Nationally Significant Infrastructure Project (NSIP), as defined under Section 16 of the Planning Act 2008 (PA 2008) (Ref 2), because it comprises a new electricity line above ground with a length of more than 2 km, and with an operating voltage of above 132 kV. Regulation 12(2) of the Environmental Impact Assessment (EIA) Regulations (Ref 3) defines preliminary environmental information as information that has been compiled by the applicant and is '*reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)*'. This PEI Report consists of three volume:

i. **PEI Report Volume 1** contains the Non-technical Summary (NTS);

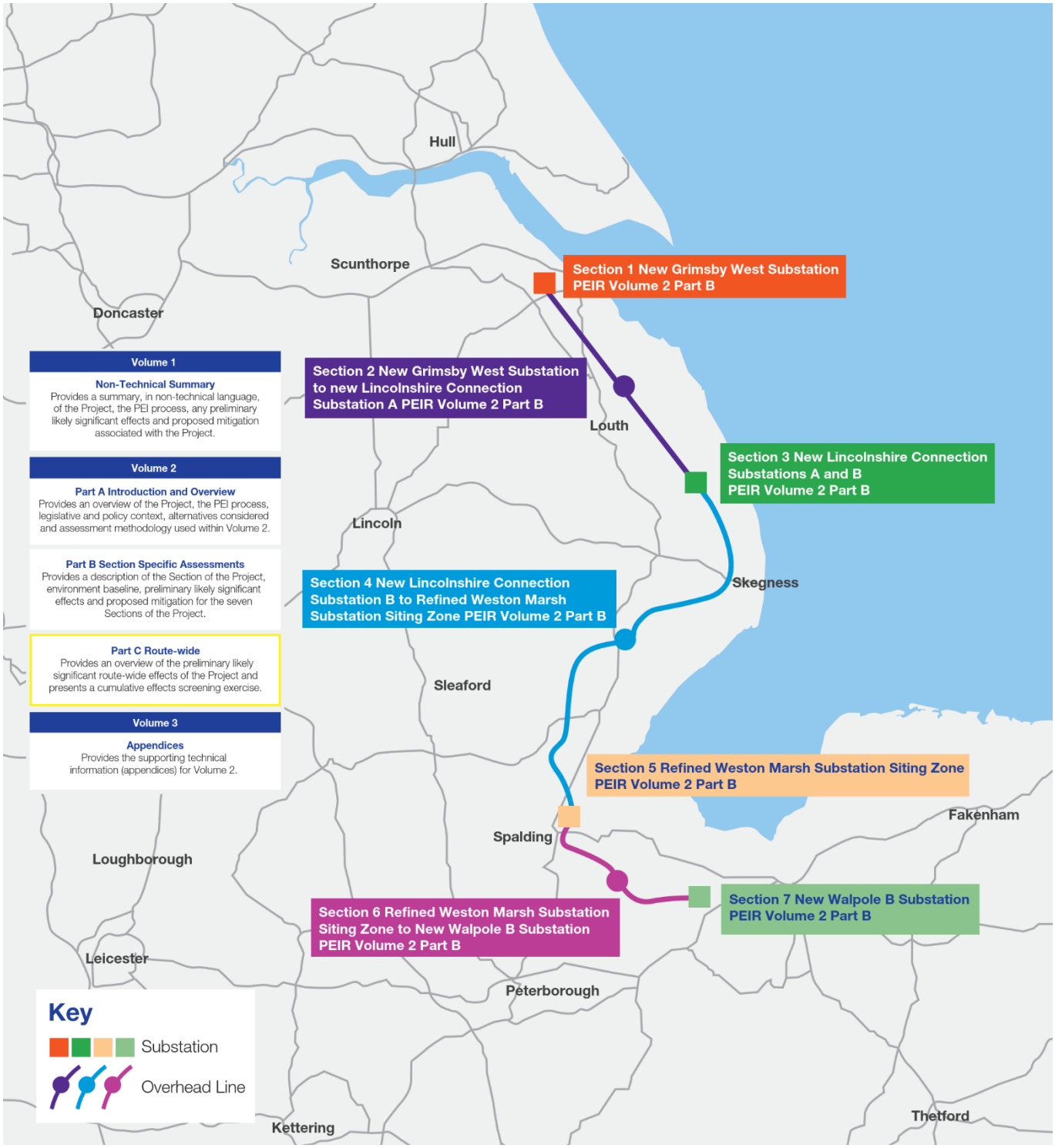
ii. **PEI Report Volume 2 Part A** contains an Introduction and Overview;

iii. **PEI Report Volume 2 Part B** contains the Section Specific Assessments;

iv. **PEI Report Volume 2 Part C** contains the Route-Wide Assessments; and

v. **PEI Report Volume 3** contains the technical appendices supporting Volume 2.

1.1.4 Further detail on the structure and content of this PEI Report is provided in the following figure:


Hull
Scunthorpe
Doncaster
Section 1 New Grimsby West Substation
PEIR Volume 2 Part B
Section 2 New Grimsby West Substation to new Lincolnshire Connection Substation A PEIR Volume 2 Part B
Louth
Section 3 New Lincolnshire Connection Substations A and B
PEIR Volume 2 Part B
Lincoln
Skegness
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone PEIR Volume 2 Part B
Sleaford
Section 5 Refined Weston Marsh Substation Siting Zone
PEIR Volume 2 Part B
Fakenham
Spalding
Loughborough
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation
PEIR Volume 2 Part B
Section 7 New Walpole B Substation
PEIR Volume 2 Part B
Leicester
Peterborough
Thetford
Kettering
Volume 1
Non-Technical Summary
Provides a summary, in non-technical language, of the Project, the PEI process, any preliminary likely significant effects and proposed mitigation associated with the Project.
Volume 2
Part A Introduction and Overview
Provides an overview of the Project, the PEI process, legislative and policy context, alternatives considered and assessment methodology used within Volume 2.
Part B Section Specific Assessments
Provides a description of the Section of the Project, environment baseline, preliminary likely significant effects and proposed mitigation for the seven Sections of the Project.
Part C Route-wide
Provides an overview of the preliminary likely significant route-wide effects of the Project and presents a cumulative effects screening exercise.
Volume 3
Appendices
Provides the supporting technical information (appendices) for Volume 2.
Key
Substation
Overhead Line

References

Ref 1 Planning Inspectorate (PINS) (2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements. [online]. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-an [Accessed 31 January 2025].

Ref 2 Planning Act 2008 [online]. Available at: https://www.legislation.gov.uk/ukpga/2008/29/part/3 [Accessed 21 February 2025].

Ref 3 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online]. Available at: https://www.legislation.gov.uk/uksi/2017/572/contents/made [Accessed 31 January 2025].

1. Introduction

nationalgrid

Contents

1. Introduction

1.1 Introduction to Grimsby to Walpole

1.1.1 The Grimsby to Walpole Project (the Project) is a proposal by National Grid Electricity Transmission plc (National Grid) to reinforce the transmission network with a new 400 kilovolt (kV) electricity transmission line over a distance of approximately 140 kilometres (km) starting from a new 400 kV substation west of the town of Grimsby in North East Lincolnshire and ending at a new 400 kV substation west of the village of Walpole St Andrew and north of the town of Wisbech, in King's Lynn and West Norfolk District. The Project also includes the construction of two new 400 kV Lincolnshire Connection Substations located south-west of Mablethorpe in East Lindsey, two new 400 kV substations in the vicinity of the Spalding Tee-Point in South Holland District and the decommissioning (in full or part) of the existing Grimsby West Substation.

1.1.2 The majority of the Project is located in the East Midlands Region, with a section to the north in Yorkshire and Humber and a section to the south in Norfolk, as illustrated on **Preliminary Environmental Information (PEI) Report Volume 2 Part A Figure 1.1 Draft Order Limits and Refined Weston Marsh Substation Siting Zone**. The draft Order Limits and Refined Weston Marsh Siting Zone (hereafter referred to as the Refined Siting Zone) lie within nine local planning authority areas. For the purpose of reporting in this PEI Report, the Project has been split into seven Sections. An assessment of the preliminary likely significant effects of each of these Sections is reported in **PEI Report Volume 2 Part B**. **PEI Report Volume 2 Part A Chapter 5 Project Description** provides further description of these Sections of the Project.

1.2 Purpose of PEI Report Volume 2 Part C

1.2.1 **PEI Report Volume 2 Part C** presents the potential impacts and likely significant effects of the construction and operation of the Project that have been identified on a route-wide level, at a geographic scale greater than the Sections presented in **PEI Report Volume 2 Part B**. Where relevant, **PEI Report Volume 2 Part C** describes the means to avoid, prevent or reduce likely significant effects of the Project along with any proposed monitoring measures. A cumulative effects screening exercise is also presented within **PEI Report Volume 2 Part C** which identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects, and the relevant environmental topics for such effects (inter-project). The full cumulative effects assessment will be reported within the ES.

1.2.2 This PEI report should be read in conjunction with **PEI Report Volume 2 Part B** and the corresponding figures. **PEI Report Volume 2 Part B** presents the assessment undertaken at a Section-level identifying the likely significant environmental effects of construction and operation within each Section of the Project, as well as any monitoring and mitigation measures.

1.3 Scope of Volume 2 Part C

1.3.1 The following potential impacts and likely significant effects are presented at a route-wide level in **PEI Report Volume 2 Part C**:

i. landscape effects upon Landscape Character Areas (LCAs) where there is a potential for these to occur at scale greater than at a Section-level;

ii. effects upon the Lincolnshire Wolds AONB;

iii. effects on ecological resources (sites statutorily designated for their international and national nature conservation importance, sites non-statutorily designated for their biodiversity value, aquatic and terrestrial habitats, protected and notable species and invasive non-native species (INNS));

iv. effects on designated heritage assets;

v. effects on water resources and flood risk;

vi. effects on Best Most Versatile (BMV) land;

vii. socio-economics effects (affected communities, labour market and strategic visitor attractions);

viii. effects on Health and Wellbeing; and

ix. effects to and from Climate Change.

1.3.2 Impacts and effects on designated heritage assets, water resources are assessed at a Section-level in **PEI Report Volume 2 Part B**, therefore **PEI Report Volume 2 Part C** provides a route-wide summary of these effects.

1.3.3 Impacts and effects on BMV land risk and ecological resources are assessed at a Section-level in **PEI Report Volume 2 Part B**. **PEI Report Volume 2 Part C** takes the output from these assessments to provide a route-wide summary of impacts and effects and assesses whether the effects would be significant when considered at a route-wide level.

1.3.4 Impacts and effects upon the Lincolnshire Wolds AONB, affected communities, labour market and strategic visitor attractions, Health and Wellbeing, Climate Change and an assessment of flood risk in relation to the Project are not considered at a Section-level in **PEI Report Volume 2 Part B**. This is because the nature of effects associated with these topics is such that they are geographically wide spread, meaning a route-wide assessment in **PEI Report Volume 2 Part C** is more appropriate and is conducted.

1.3.5 Traffic and Movement, Noise and Vibration, Air Quality, Visual and Geology and Hydrogeology are assessed within **PEI Report Volume 2 Part B**, but are not considered within **PEI Report Volume 2 Part C** at a route-wide level as the receptors and likely significant effects associated with these topics are localised.

1.3.6 **PEI Report Volume 2 Part C Chapter 10 Cumulative Effects** then presents the preliminary cumulative effects assessment methodology and screening exercise. This methodology and screening exercise presents two distinct assessment types:

i. the intra-project cumulative effects assessment; and

ii. the inter-project cumulative effects assessment.

1.3.7 For the intra-project cumulative effects assessment within **PEI Report Volume 2 Part C Chapter 10 Cumulative Effects**, this PEI Report presents an initial pre-screening assessment showing how the receptor groups are likely to interact between topics. As this PEI Report is presenting a preliminary assessment and some of the topics have not been able to confirm the level of significance for identified effects, a full intra-project cumulative effects assessment will be undertaken at ES stage.

1.3.8 For the inter-project cumulative effects assessment within **PEI Report Volume 2 Part C Chapter 10 Cumulative Effects**, an initial screening exercise of Committed Developments has been undertaken to identify a list of Committed Developments currently within the consenting process that are within 10 km of the Project. This has then been reviewed to generate a shortlist of developments for consideration based on the scale and nature of the Committed Development, and the potential for interactions with the Project across all environmental topics. Both the longlist and shortlist will remain under review until the submission of the final ES to ensure all new applications are considered within the assessment at ES Stage. Further details on the assessment methodology used in **PEI Report Volume 2 Part C Chapter 10 Cumulative Effects** is provided in **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**.

1.4 Structure of Volume 2 Part C

1.4.1 **PEI Report Volume 2 Part C** is structured as follows:

i. Chapter 1 Introduction;

ii. Chapter 2 Landscape;

iii. Chapter 3 Ecology and Biodiversity;

iv. Chapter 4 Historic Environment;

v. Chapter 5 Water Environment and Flood Risk;

vi. Chapter 6 Agriculture and Soils;

vii. Chapter 7 Socio-economics, Recreation and Tourism;

viii. Chapter 8 Health and Wellbeing;

ix. Chapter 9 Climate Change; and

x. Chapter 10 Cumulative Effects.

2. Landscape

nationalgrid

Contents

2. Landscape

2.1 Introduction

2.1.1 This chapter presents an appraisal of the route-wide preliminary impacts and likely significant effects of the Grimsby to Walpole Project (the Project) on the Lincolnshire Wolds National Landscape[1] Area of Outstanding Natural Beauty ('the AONB'). AONB are designated under Section 82 of the Countryside and Rights of Way Act 2000 (CRoW Act) (Ref 1) for the statutory purpose of conserving and enhancing their natural beauty.

2.1.2 The character of the landscape covered by the AONB and its setting, as well as the impacts and significant effects of the Project upon the Regional Landscape Character Types (RLCTs) are reported upon at a Section-level in **PEI Report Volume 2 Part B Sections 1-7 Chapter 2 Landscape**. This includes a consideration of the potential aggregated route-wide effects upon RLCTs that straddle the Study Area of more than one Section.

2.1.3 This chapter is supported by the following figures and appendices:

i. **PEI Report Volume 2 Part C Figure 2.1 Landscape Study Area**;

ii. **PEI Report Volume 2 Part C Figure 2.2. Landscape character areas in relation to the Lincolnshire Wolds National Landscape**; and

iii. **PEI Report Volume 2 Part C Figure 2.3 Visual receptors in relation to the Lincolnshire Wolds National Landscape**.

2.2 Scope of the Appraisal

2.2.1 The scope of the appraisal has been informed by the Scoping Opinion (Ref 2) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the Environmental Impact Assessment (EIA) Scoping Report (Ref 3). Whilst direct effects were scoped out as there is no overlap between the draft Order Limits and Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) and the AONB, indirect effects on the composition and character of the landscape and on key views to and from the AONB were scoped in for construction and operation. Maintenance was scoped out for both landscape and visual receptors.

2.2.2 The scope has also been informed through consultation and engagement with relevant consultees. As detailed within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses** consultees expressed concern about the importance of the AONB and highlighted the need for potential impacts on the AONB to be considered in relation to the Project. A summary of the

[1] 'National Landscape' is the rebranded name for areas of outstanding natural beauty (AONBs). This name change is not statutory. For the purpose of this assessment, the Lincolnshire Wolds National Landscape will be referred to as 'the AONB'.

stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement.**

2.2.3 In response to comments from consultees, this chapter draws on the assessments set out in the relevant sections of **PEI Report Volume 2 Part B Sections 1-4 Chapter 2 Landscape** to provide a more detailed, route-wide appraisal of the Project's effects on the Special Qualities and statutory purpose of the AONB. This additional analysis is provided because, although Sections 1 – 4 of the Project lie outside the AONB boundary, the proposed alignment is located approximately 2 km from its eastern edge and may indirectly influence its Special Qualities.

2.2.4 **PEI Report Volume 2 Part C Figure 2.1 Landscape Study Area** shows the location of the AONB relative to the draft Order Limits and Refined Siting Zone.

2.2.5 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.

2.3 Appraisal Approach

2.3.1 This appraisal draws together the preliminary, systematic assessments presented in **PEI Report Volume 2 Part B Sections 1-4 Chapter 2 Landscape** to provide a broader, route-wide judgement of the Project's overall effects on the AONB.

2.3.2 As such it does not follow the methodology provided in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** but instead takes a more integrative and interpretative approach. It draws on the outputs of individual assessments to form a higher-level, more strategic professional judgement.

2.4 Characteristics of the Lincolnshire Wolds AONB

Introduction

2.4.1 The AONB is a statutorily designated high-value Protected Landscape[2] located in the north eastern part of Lincolnshire, midway between Lincoln and the coast.

2.4.2 As illustrated in **PEI Report Volume 2 Part C Figure 2.1 Landscape Study Area**, the AONB lies outside the draft Order Limits of the Project but falls within the 5 km Landscape and Visual Study Areas for the following Sections of the Project:

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; and

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

2.4.3 The appraisal presented in this chapter focuses on the eastern side of the AONB as this falls within the Study Area as shown on **PEI Report Volume 2 Part C Figure 2.1**

[2] 'Protected Landscapes' refers to National Parks, the Norfolk and Suffolk Broads and National Landscapes in England.

Landscape Study Area and is the area most likely to be affected by landscape and visual changes caused by the Project (which are detailed further in **PEI Report Volume 2 Part B Sections 1-4 Chapter 2 Landscape**). As shown in **PEI Report Volume 2 Part C Figure 2.1 Landscape Study Area** and demonstrated by the setting study presented in **PEI Report Volume 3 Part C Appendix 2A Setting Study**, the western side of the AONB is too distant from the Project for its Special Qualities to be significantly affected.

2.4.4 It should be noted that the assessment that has informed the conclusions in this preliminary route-wide appraisal remains ongoing and is subject to change due to ongoing survey activities and further design development of the Project. A full detailed assessment will be included within the ES submitted with the DCO application.

Legislation and Policy Framework

2.4.5 As explained in the Guidance for relevant authorities on seeking to further the purposes of Protected Landscapes ('the Guidance') (Ref 4), the term 'Protected Landscapes' refers to National Parks, the Norfolk and Suffolk Broads and National Landscapes in England (Ref 4). 'National Landscapes' is the rebranded name for AONBs. This name change is not statutory.

2.4.6 The Guidance then sets out the Protected Landscape duty as follows:

'Section 245 (Protected Landscapes) of the Levelling-up and Regeneration Act 2023 (LURA) amends the duty on relevant authorities in respect of their functions which affect land in National Parks, National Landscapes, and the Norfolk and Suffolk Broads in England.

Relevant authorities must now 'seek to further' the statutory purposes of Protected Landscapes. This replaces the previous duty on relevant authorities to 'have regard to' their statutory purposes.

The duty is intended to facilitate better outcomes for England's Protected Landscapes, which are in line with their statutory purposes. The duty does not prevent relevant authorities from undertaking their statutory functions and discharging their legal duties and other responsibilities. The duty is intended to complement these requirements by ensuring that the purposes for which Protected Landscapes are designated for are recognised in reaching decisions and undertaking activities that impact these areas.

When seeking to further the purposes, relevant authorities should consider the information contained in a Protected Landscape's Management Plan. Management Plans describe the natural beauty, special qualities and key characteristics of and targets and objectives for the designation.

Consideration of what is reasonable and proportionate in the context of fulfilling the duty is decided by the relevant authority and should take account of the context of the specific function being exercised'.

2.4.7 The Guidance further clarifies that the Protected Landscapes duty is an active rather than passive obligation, which means that:

i. *'a relevant authority should take appropriate, reasonable, and proportionate steps to explore measures which further the statutory purposes of Protected Landscapes.*

ii. *as far as is reasonably practical, relevant authorities should seek to avoid harm and contribute to the conservation and enhancement of the natural beauty, special qualities, and key characteristics of Protected Landscapes.*

iii. *for development plan making and development management decisions affecting a Protected Landscape, a relevant authority should seek to further the purposes of the Protected Landscape - in so doing, the relevant authority should consider whether such measures can be embedded in the design of plans and proposals, where reasonably practical and operationally feasible'.*

2.4.8 When seeking to further the purposes, relevant authorities should consider the information contained in a Protected Landscape's Management Plan.

2.4.9 The Guidance outlines how the Protected Landscapes duty is intended to operate and sets out the key considerations that a relevant authority should take into account in fulfilling its statutory obligations. These include whether '*the relevant Protected Landscape team been approached for their views on whether or not measures help to deliver the Protected Landscape's Management Plan and further the purposes of the designation'*.

2.4.10 The presence of the Project along the eastern edge of the AONB may conflict with the natural beauty, special qualities, and key characteristics of the Protected Landscape.

2.4.11 National Grid Electricity Transmission plc (National Grid) has held initial discussions with representatives from Natural England and the Lincolnshire Wolds AONB Partnership ('the AONB Partnership'), which together with site visits and preparation of the AONB setting study have informed the inclusion of low-height pylons along the section of the route between Barnolby-le-Beck and Waithe. Further engagement will be undertaken with the AONB Partnership to seek their views on the extent to which such measures contribute to delivering the objectives of the AONB Management Plan and furthering the statutory purposes of the designation. The outcome of these discussions will inform the detailed assessment which will be presented in the Environmental Statement (ES).

Statutory purpose of the Lincolnshire Wolds National Landscape (AONB)

2.4.12 The Guidance defines the statutory purposes of National Landscapes with Conservation Boards as follows:

i. *'conserving and enhancing the natural beauty of the area of outstanding natural beauty'.*

ii. *'increasing the understanding and enjoyment by the public of the special qualities of the area of outstanding natural beauty'.*

The Lincolnshire Wolds AONB Management Plan (2018-23)

2.4.13 The AONB Partnership is the main delivery body responsible for producing and reviewing the Lincolnshire Wolds AONB Management Plan (Ref 5) ('the AONB Management Plan') every five years under the CRoW Act (Ref 1). It is endorsed by the Lincolnshire Wolds Joint Advisory Committee (JAC).The AONB Management Plan describes the natural beauty, special qualities, and key characteristics of a Protected Landscape, articulating the features of the landscape that warrant its nationally designated and protected status.

2.4.14 The purpose of the AONB Management Plan is to provide a strategic framework for protecting, conserving and enhancing the natural beauty, landscape and biodiversity of the AONB, balancing conservation with the needs of local communities, visitors and landowners.

2.4.15 The current AONB Management Plan (2018-23) (Ref 5) was endorsed by the JAC in 2018. In March 2023, the JAC, on behalf of local authorities (Lincolnshire County, East Lindsey, West Lindsey and North East Lincolnshire Councils), decided to delay the production of the next plan and retain the existing policies and objectives pending further review.

2.4.16 The production of five-yearly management plans is a statutory duty for all local authorities with AONBs, or part of an AONB within their administrative boundaries. One management plan must be produced in partnership with other local authorities and relevant statutory bodies.

2.4.17 Table 3 - The Lincolnshire Wolds AONB 5 Year Action Plan 2018-2023 in the AONB Management Plan (Ref 5) outlines long-term objectives and policies across the five delivery themes of:

i. Theme 1: Protecting the Wolds;

ii. Theme 2: Living and Working in the Wolds;

iii. Theme 3: Discovering the Wolds;

iv. Theme 4: Developing the Wolds; and

v. Theme 5: Partnerships in the Wolds.

2.4.18 Of these, Theme 4 is relevant to the Project, stating in Section 7.1 that *'The Wolds AONB is particularly vulnerable to inappropriate development on account of its strong rural character and tranquillity, its extensive plateau tops and open views, and its dark night skies. Furthermore there is wide spread recognition that the topography of the Wolds is subtle and complex, and that its juxtaposition with the low lying costal grazing marshes to the east and the equally flat clay vale to the west, make the area especially sensitive to neighbouring development which can potentially impact upon both the setting and the expansive views to and from the AONB'*.

2.4.19 Section 7.1 of the Management Plan identifies a number of key issues affecting the AONB, including the *'proliferation of often unsightly telecommunication masts and their associated infrastructure (similarly with overhead powerlines)*'.

2.4.20 In response to the key issues, the Management Plan sets out an overarching objective *'to seek to ensure that development plans and planning guidance consistently recognise and uphold the primary purpose of the Lincolnshire Wolds AONB designation – the protection and enhancement of its natural beauty and special character*'.

2.4.21 This objective is supported by a number of policies, of which the following are relevant to the Project:

'PP5 - To promote awareness and encourage consideration of the impact of adjacent development on the views to and from the AONB'.

'PP9 - To ensure that where larger scale development must proceed within or adjacent to the AONB, because of other national interests, the highest regard is

placed on minimising any impacts upon the primary purpose of the designation – the area's natural beauty'.

2.4.22 Although the Project would not directly affect the AONB and is broadly aligned with most of the AONB Management Plan's objectives and policies, its proximity to the eastern edge of the Wolds means it may not be fully compliant with the**se policies.**

Development in the setting of Protected Landscapes

2.4.23 Government Guidance on Protected Landscapes (Ref 4) explains that the Protected Landscapes duty also applies to functions that are undertaken outside of the designation boundary but affect land within the Protected Landscape, stating that:

'Natural beauty, special qualities, and key characteristics can be highly dependent on the contribution provided by the setting of a Protected Landscape. Aspects such as tranquillity, dark skies, a sense of remoteness, wildness, cultural heritage or long views from and into the Protected Landscape may draw upon the landscape character and quality of the setting.

Functional connectivity is also important where there are flows or close interconnection between the Protected Landscape and its setting, for example:

i. a shared water catchment and management of water resources

ii. ecological connectivity where species are able to move across and between the designated and non-designated area

iii. Rights of Way, Open Access Land and other recreational links joining the designated area to the wider countryside.

Development and the management of land, water and estates located in the setting have the potential to adversely affect the natural beauty, special qualities, and key characteristics of a Protected Landscape'.

2.4.24 This underscores the importance of assessing the potential influence of external projects on the visual integrity and scenic value of Protected Landscapes, even when as for the Project they fall outside the designated area.

The Setting of the Lincolnshire Wolds National Landscape (AONB)

2.4.25 The setting of the AONB is described in **PEI Report Volume 3 Part C Appendix 2A Setting Study** and shown in **PEI Report Volume 2 Part C Figure 2.1 Landscape Study Area**. The setting of the AONB refers to landscapes within the Project area that, although outside the boundary of the designated area, contribute to its character and visual quality.

2.4.26 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.

2.4.27 Beyond the setting of the AONB defined in the Setting Study, the landscape extends further eastward into a broader and more distant visual context. Although this area is outside the AONB's defined setting, it still contributes to the overall sense of openness and scale in views from within the AONB. However, due to the intervening

distance, any changes to this distant landscape are less likely to influence the overall experience of views from the AONB.

2.4.28 As illustrated in **PEI Report Volume 2 Part C Figure 2.1 Landscape Study Area**, the Project, including the proposed 400 kV overhead line in Sections 1-4 and Lincolnshire Connection Substation A and B (in Section 3), fall within the eastern edge of the defined AONB setting. This means that elements of the Project could be visible in views to and from the designated landscape, which could influence how the AONB is perceived, particularly from its eastern boundary.

Landscape Character

2.4.29 Topographically, the Lincolnshire Wolds ('the Wolds') are a range of low hills which run broadly parallel with the North Sea coast, from the Humber Estuary in the north west to the edge of the Lincolnshire Fens in the south east. The Wolds create a prominent chalk escarpment to the west, but to the east, the land rises gently from the coastal plain and is not a particularly prominent physiographic feature.

2.4.30 The Wolds has a strong unity of visual character, characterised by open plateau hilltops, sweeping views, strong escarpments, wide grass verges and ridge-top routeways, dramatic wooded slopes and valleys, beech clumps and natural and historic features of great interest including visual remnants of ancient tumuli and deserted/shrunken medieval villages. The Wolds are generally sparsely populated, with villages mainly situated at the base of the slopes. Only a few small towns, such as Barnetby, Spilsby and Caistor, are located within the Wolds and these have retained much of their historic built character.

2.4.31 The landscape differs from other chalk and limestone landscapes in the extent of arable cultivation, made possible by the area's fertile chalk and glacial tills. The 'typical' chalk downland features of calcareous grassland and sheep walk were probably never widespread in the Wolds due to the thinness of the chalk and the fact that much of the area is covered by glacial till. The area subsequently has a long association with cultivated farming practices. Surviving semi-natural habitats, such as grasslands and ancient woodlands, are rare but important.

2.4.32 Besides the distinctive and widely nucleated villages and hamlets within the Wolds, the surrounding market towns of Louth, Horncastle and Market Rasen have integral connections with the area. The Wolds remain sparsely populated and tranquil and the roles of the market towns are very important in providing a wide range of social and economic services for the wider community, while also operating as important recreational gateways to the surrounding countryside.

2.4.33 The AONB Management Plan (Ref 5) identifies four distinct Local Landscape Character Areas (LLCAs) within the AONB, each contributing to the unique scenic qualities and ecological diversity of the area:

i. The North-west Scarp (lies outside the 5 km Study Area);

ii. The Chalk Wolds;

iii. The Ridges and Valleys of the South-west; and

iv. The South-eastern Claylands.

2.4.34 These LLCAs are defined based on their topography, land use, vegetation and historical influences, helping to guide conservation efforts and inform landscape

management decisions. The extent and detailed descriptions of these LLCAs are provided in Map 5 and Appendix 3 of the AONB Management Plan (Ref 5), offering a comprehensive understanding of their defining features and sensitivities.

2.4.35 The boundaries of the LLCAs broadly correspond with those defined in the East Midlands Regional Landscape Character Assessment (Ref 6), which formed the basis of the preliminary assessment presented in **PEI Report Volume 2 Part B Sections 1–4 Chapter 2 Landscap**e, and illustrated in **PEI Report Volume 2 Part C Figure 2.2 Landscape character areas in relation to the Lincolnshire Wolds National Landscape**. The principal difference is that RLCT 7A Chalk Wolds is divided between two LLCAs – Chalk Wolds and South-east Claylands.

2.4.36 A detailed assessment of the Project's effects on these LLCAs will be included in the route-wide evaluation of its impact on the AONB presented in the ES.

Special Qualities of the Lincolnshire Wolds AONB

2.4.37 Table 1 in the AONB Management Plan (Ref 5) summarises the special landscape features that typify the natural beauty and sense of place of the Lincolnshire Wolds. These include Landscape Character, Earth Heritage, Biodiversity, Archaeology, and Cultural Associations. Table 1 also includes estimates of the extent or coverage of any feature and an indication of its condition.

2.4.38 Of the Special Qualities listed in Table 1 of the AONB Management Plan, Landscape Character is the only one likely to be affected by the Project. This is because the Project does not pass through the AONB itself and, therefore, will not directly impact other defining qualities, such as the area's natural landforms (physiography), biodiversity, or patterns of land use.

2.4.39 Appendix 3 of the AONB Management Plan (Ref 5) sets out the key local features and potential issues that could face the LLCAs within the AONB, of which the following are relevant to the Project:

i. Chalk Wolds LLCA - threats to views out to the coastal marshes (e.g. wind farms, tourism developments);

ii. Ridges and Valleys of the South-west - dramatic views south from the Bluestone Heath Road; and

iii. South-Eastern Clayland - views across the Middle Marsh to the coast.

2.4.40 The AONB Management Plan (Ref 5) provides the strategy for the future management of the AONB, detailing a series of objectives, policies and management statements across the following five themes that are used to help group individual topics:

i. Protecting the Wolds;

ii. Living and Working in the Wolds;

iii. Discovering the Wolds;

iv. Developing the Wolds; and

v. Partnerships in the Wolds.

2.4.41 The two most relevant themes to the Project are Protecting the Wolds and Developing the Wolds. The other themes are not considered relevant because the Project does not pass through the AONB.

Theme 1 - Protecting the Wolds

2.4.42 Theme 1 is outlined in Section 4 of the AONB Management Plan (Ref 5). Section 4.1 states that:

> *'As detailed previously, the Wolds Landscape Character Assessment identified four landscape character areas within the AONB and highlighted the important landscape qualities of the Lincolnshire Wolds. Table 1 and Appendix 3 have been collated for this Plan, and together outline the special qualities of the AONB, where possible listing their current extent and condition. These are the principal elements of the natural beauty and landscape character of the Wolds.*
>
> *The Wolds scenery is subtle and complex, but has a clear identity resulting from physical and human influences over many generations. It has a very open character with extensive outward views both eastwards to the coast and westwards across the Central Lincolnshire Vale. The views within the AONB are equally dramatic and are shaped by the open rolling hills, hidden valleys and continually changing patterns of farming. The ridge-top locations provided by the Bluestone Heath Road, the Caistor High Street and the west-east drovers roads provide some of the area's best known and most frequented viewing points'.*

2.4.43 Section 4.1 lists the key landscape/character potential issues, including the following, which are relevant to the Project:

i. *'Inappropriate or insensitive development both within and adjacent to the AONB including potential pressures from quarrying activity, wind farms, telecommunication infrastructure and new overhead electrical wires;*

ii. *Safeguarding the dramatic escarpment and ridge-top views; and*

iii. *Impact upon views within, from, and to the AONB, including cumulative impacts from neighbouring developments'.*

2.4.44 It then emphasises how the '*expansive views*' make the area particularly sensitive to landscape changes.

Theme 4 - Developing the Wolds

2.4.45 Theme 4 is outlined in Section 7 of the AONB Management Plan (Ref 5). After introducing and providing an overview of the current management issues, Theme 4 concludes in Section 7.1 that:

> *'The Wolds AONB is particularly vulnerable to inappropriate development on account of its strong rural character and tranquillity, its extensive plateau tops and open views, and its dark night skies. Furthermore, there is widespread recognition that the topography of the Wolds is subtle and complex, and that its juxtaposition with the low lying coastal grazing marshes to the east and the equally flat clay vale to the west, make the area especially sensitive to neighbouring development which can potentially impact upon both the setting and the expansive views to and from the AONB'.*

2.4.46 Key issues highlighted in Section 7.1 include the *'proliferation of often unsightly telecommunication masts and their associated infrastructure (similarly with overhead powerlines)'*.

2.4.47 Regarding Theme 4, the AONB Management Plan (Ref 5) sets out the following objective and policies.

'Objective:

PO To seek to ensure that development plans and planning guidance consistently recognise and uphold the primary purpose of the Lincolnshire Wolds AONB designation – the protection and enhancement of its natural beauty and special character'.

Policies:

PP05 To promote awareness and encourage consideration of the impact of adjacent development on the views to and from the AONB.

PP09 To ensure that where larger scale development must proceed within or adjacent to the AONB, because of other national interests, the highest regard is placed on minimising any impacts upon the primary purpose of the designation – the area's natural beauty'.

2.4.48 These policies highlight the significance of both the AONB's setting and the visual connections to and from the designated area. The openness of these expansive views is a key characteristic, making the landscape especially sensitive to unsuitable land use or development that could compromise its scenic quality.

2.5 Route Wide Summary of Effects on the Lincolnshire Wolds

2.5.1 **PEI Report Volume 2 Part B Sections 1-4 Chapter 2 Landscape** and **PEI Report Volume 2 Part B Sections 1-4 Chapter 3 Visual** present the preliminary assessment of effects on landscape character and views to and from the Lincolnshire Wolds, without specific reference to the AONB designation. The information relevant to the route-wide appraisal conducted in this chapter is summarised below.

Preliminary Assessment of Effects on the Landscapes of the Lincolnshire Wolds

2.5.2 A preliminary assessment of the effects on the following RLCTs which cover the eastern side of the Lincolnshire Wolds, as identified in the East Midlands Regional Landscape Character Assessment (Ref 6), is presented in **PEI Report Volume 2 Part B Sections 1-4 Chapter 2 Landscape**.

2.5.3 As shown in **PEI Report Volume 2 Part C Figure 2.2 Landscape character areas in relation to the Lincolnshire Wolds National Landscape**, the following RLCTs are relevant to the AONB:

i. RLCT 2C: Fen and Marsh Margin Farmlands;

ii. RLCT 7A: Chalk Wolds; and

iii. RLCT 7B: Wolds, Scarps, Ridges, and Valleys.

Summary of effects on RLCT 2C: Fen and Marsh Margin Farmlands and implications for the AONB

2.5.4 RLCT 2C Fen and Marsh Margin Farmlands is recognised as a landscape of high value and medium susceptibility to the Project. It is a transitional landscape between the higher ground of the Wolds to the west and the coastal plain to the east. Much of it is within the setting of the AONB and small parts of its western edge are within the AONB. The RLCT 2C Fen and Marsh Margin Farmlands is within the Section 2 – 4 Study Areas of the Project.

Construction

2.5.5 **PEI Report Volume 2 Part B Section 2 Chapter 2 Landscape** reports no significant effects on RLCT 2C Fen and Marsh Margin Farmlands during construction of Section 2. It would be directly impacted by the construction of approximately 30 km of new overhead line, including pylons GL35-GL118 and by minor road works to facilitate access along Alvingham Road, one main construction compound, and one satellite construction compound. However, most work would occur at ground level, with some limited at-height tasks requiring mobile cranes, minimising the scale of change. The works would add to existing movement and disturbance in the settled farmland but would not fundamentally alter the perception or character of the landscape. The overall magnitude of predicted change is small. Combined with the landscape's high value and medium susceptibility, this is unlikely to significantly affect the part of the RLCT in Section 2.

2.5.6 **PEI Report Volume 2 Part B Section 3 Chapter 2 Landscape** reports likely significant effects on RLCT 2C Fen and Marsh Margin Farmlands during construction of Section 3. It would be directly impacted by the construction of the new Lincolnshire Connection Substation A and B, approximately 4.5 km of overhead line, including pylons GL119, GL120, and GL122, as well as LB2, LB3, LB5-LB18, and LB20, and LW2, LW4-LW5. Two construction compounds and a haul road would also be present. It would affect an area of settled farmland that partly lies within the AONB setting and is currently unaffected by high voltage electricity infrastructure. The size/scale of change resulting from the Project's construction would diminish the farmland's rural character. The overall magnitude of predicted change is medium. Combined with the landscape's high value and medium susceptibility, this would result in a likely significant effect on the part of the RLCT in Section 3.

2.5.7 **PEI Report Volume 2 Part B Section 4 Chapter 2 Landscape** reports no significant effects on RLCT 2C Fen and Marsh Margin Farmlands during construction of Section 4. It would be directly impacted by the construction of approximately 6 km of new overhead line, including pylons LW5-LW22 and by minor road works to facilitate access along Ingoldmells Road near Burgh le Marsh and the B1195 near Irby in the Marsh. Most work would occur at ground level, with some limited at-height tasks requiring mobile cranes, minimising the scale of change. The works would add to existing movement and disturbance in the settled farmland but would not fundamentally alter the perception or character of the landscape. Overall, the magnitude of predicted change is small. Combined with the landscape's high value and medium susceptibility, this is unlikely to significantly affect the part of the RLCT in Section 4.

2.5.8 When considering the construction phase of the Project in its entirety across all Sections, the overall magnitude of predicted change increases but remains in the medium category. Combined with the high value and medium susceptibility, this

would result in a likely significant effect on RLCT 2C: Fen and Marsh Margin Farmlands. Given that much of this RLCT is within the setting of the AONB, and small parts of its western edge are within the designated area, this suggests that there would be likely significant construction effects on the parts of the AONB within RLCT 2C Fen and Marsh Margin Farmlands. The area of the AONB most likely to experience the greatest level of effect is the central part of its eastern edge, particularly in respect of Section 3, where the construction of two new substations is proposed.

Operation

2.5.9 **PEI Report Volume 2 Part B Section 2 Chapter 2 Landscape** reports likely significant effects on RLCT 2C Fen and Marsh Margin Farmlands during operation of Section 2. The most noticeable part of the Project would be the presence of approximately 30 km of new 400 kV overhead line (pylons GL35-GL118) that would cross the central part of the RLCT along the full length of Section 2. The size/scale of change resulting from the Project would diminish the farmland's rural character, which currently has few detractors. The overall magnitude of predicted change is medium. Combined with the landscape's high value and medium susceptibility, this would result in a likely significant effect on the part of the RLCT in Section 2.

2.5.10 **PEI Report Volume 2 Part B Section 3 Chapter 2 Landscape** reports likely significant effects on RLCT 2C Fen and Marsh Margin Farmlands during the operation of Section 3. The new Lincolnshire Connection Substation A would be located close to the east of Mother Wood and Greenfield Wood, while the new Lincolnshire Connection Substation B would be in farmland to the north east of Bilsby. Approximately 4.5 km of new 400 kV overhead line, including pylons GL119, GL120 and GL122, LB2, LB3, LB5-LB18 and LB20 and LW2, LW4-LW5 would run through the central part of the RLCT. The size/scale of change resulting from the presence of the two new substations would diminish the rural character of the farmland. The overall magnitude of predicted change is medium. Combined with the landscape's high value and medium susceptibility, this would result in a likely significant effect on the part of the RLCT in Section 3. Over time, the mitigation planting associated with the two new substations would mature, providing some infrastructure screening. This may slightly reduce the overall effects on the landscape, but due to the size and scale of the Project, the effect is likely to be significant.

2.5.11 **PEI Report Volume 2 Part B Section 4 Chapter 2 Landscape** reports likely significant effects on RLCT 2C Fen and Marsh Margin Farmlands during the operation of Section 4. Approximately 6 km of new 400 kV overhead line (pylons LW5 to LW22) would cross the eastern part of the RLCT between Bilsby and Sloothby. The RLCT would also be indirectly affected by the presence of the new 400 kV overhead line which would run close to and broadly parallel to the eastern edge of the RLCT between Sloothby and Thorpe Fendykes. It would affect an area of settled farmland that partly lies within the setting of AONB and is currently unaffected by high voltage electricity infrastructure. The size/scale of change resulting from the Project would diminish the farmland's rural character. The overall magnitude of predicted change is medium. Combined with the landscape's high value and medium susceptibility, this would result in a likely significant effect on the part of the RLCT in Section 4.

2.5.12 When considering the operational phase of the Project, in its entirety across all Sections, the overall magnitude of predicted change increases to large as the Project

extends through the centre of the RLCT for approximately 40 km. It would affect an area of settled farmland that is currently unaffected by high voltage electricity infrastructure. Combined with the high value and medium susceptibility, this would result in a likely significant effect on RLCT 2C: Fen and Marsh Margin Farmlands. Given that much of this RLCT is within the setting of the AONB, and small parts of its western edge are within the designated area, this suggests that there would be likely significant operational effects on the parts of the AONB within RLCT 2C Fen and Marsh Margin Farmlands. The area of the AONB most likely to experience the greatest level of effect is the central part of its eastern edge, particularly within Section 3, where the construction of two new substations is proposed.

Summary of effects on RLCT 7A Chalk Wolds and implications for the AONB

2.5.13 RLCT 7A Chalk Wolds is recognised as a landscape of very high value and susceptibility to the Project. Its distinctive chalk uplands, open views, and scenic quality are integral to the character and visual appeal of the landscape, making it highly sensitive to change. The plateau is dominated by large arable fields and changing crop patterns, contrasting sharply with the pastures and wooded slopes of the valleys.

2.5.14 Most of RLCT 7A Chalk Wolds lies within the AONB and falls within the Section 1 – 4 Study Areas of the Project, although no part of the Project itself is located within this Landscape Character Type.

Construction

2.5.15 **PEI Report Volume 2 Part B Section 1 Chapter 2 Landscape** reports no significant effects on RLCT 7A Chalk Wolds during construction of Section 1. While the construction of the New Grimsby West Substation and pylons GL3 and GL4 may be present in views from a small part of the RLCT, the works would be partially obscured by the intervening woodland. They would also be seen in the context of settlement and infrastructure, including the existing substation, pylons and wind turbines. The overall magnitude of predicted change is small. Even given the landscape's very high value and susceptibility, this is unlikely to significantly affect the part of the RLCT in Section 1.

2.5.16 **PEI Report Volume 2 Part B Section 2 Chapter 2 Landscape** reports no significant effects on RLCT 7A Chalk Wolds during construction of Section 2. While construction of the Project (pylons GL36-GL120 approximately) may be present in views east of this elevated RLCT, the intervening woodland would obscure most of the works. Tall cranes and high-level activity may be visible but only relatively briefly at each pylon location. The overall magnitude of predicted change is small. Even given the landscape's very high value and susceptibility, this is unlikely to significantly affect the part of the RLCT in Section 2.

2.5.17 **PEI Report Volume 2 Part B Section 3 Chapter 2 Landscape** reports no significant effects on RLCT 7A Chalk Wolds during construction of Section 3. While construction of the Lincolnshire Connection Substation A and B infrastructure (and pylons GL119, GL120 and GL122, LB2, LB3, LB5-LB18 and LB20 and LW2, LW4-LW5) may be present in views east out of this elevated RLCT, most of the works would be obscured by the intervening woodland and settlement of Alford. Tall cranes and high-level activity may be visible, but only relatively briefly and seen from distances greater than 2 km, further diminishing the perceived size and scale of the effect. The overall magnitude of predicted change is small. Even given the landscape's very high

value and susceptibility, this is unlikely to significantly affect the part of the RLCT in Section 3.

2.5.18 **PEI Report Volume 2 Part B Section 4 Chapter 2 Landscape** reports no significant effects on RLCT 7A Chalk Wolds during construction of Section 4. While the Project (pylons LW3-LW43 approximately) may be present in views east of this elevated RLCT, the intervening woodland would obscure most works. Tall cranes and high-level activity may be visible, but only relatively briefly and seen from distances greater than 4 km, further diminishing the perceived size and scale of the effect. The overall magnitude of predicted change is small. Even given the landscape's very high value and susceptibility, this is unlikely to significantly affect the part of the RLCT in Section 4.

2.5.19 When considering the construction phase of the Project in its entirety across all Sections, however, the overall magnitude of predicted change increases to medium. Combined with the very high value and susceptibility, this would result in a likely significant effect on RLCT 7A Chalk Wolds, much of which is in the AONB.

Operation

2.5.20 **PEI Report Volume 2 Part B Section 1 Chapter 2 Landscape** reports no significant effects on RLCT 7A Chalk Wolds during operation of Section 1. The most noticeable part of the Project would be the new pylons (GL3 and GL4). These would be visible on the skyline but would be seen alongside other pylons and wind turbines. The overall magnitude of predicted change is small. Even given the landscape's very high value and susceptibility, this is unlikely to significantly affect the part of the RLCT in Section 1.

2.5.21 **PEI Report Volume 2 Part B Section 2 Chapter 2 Landscape** reports likely significant effects on RLCT 7A Chalk Wolds during the operation of Section 2. The Project would run broadly parallel to the east of and within 2 - 3 km of the RLCT for approximately 25 km in Section 2. Although there are current views of multiple wind turbines and industry along the coast, these detractors are too distant to affect the RLCT’s character adversely. The most noticeable part of the Project would be the new pylons (GL36-GL120 approximately). The new 400 kV overhead line would be visible on the skyline and detract from the rural character of the views from the Wolds. The overall magnitude of predicted change is medium. Combined with the landscape's very high value and susceptibility, this would result in a likely significant effect on the part of the RLCT in Section 2.

2.5.22 **PEI Report Volume 2 Part B Section 3 Chapter 2 Landscape** reports likely significant effects on RLCT 7A Chalk Wolds during the operation of Section 3. While the Project may be present in views east of this elevated RLCT, most of the Lincolnshire Connection Substation A and Lincolnshire Connection Substation B infrastructure would be obscured by the intervening woodland and settlement of Alford. It would also be seen at distances greater than 2 km distant, which would further reduce the size/scale of the effect. The most noticeable part of the Project would be the new pylons (GL119, GL120 and GL122, LB2, LB3, LB5-LB18 and LB20 and LW2, LW4-LW5). The new 400 kV overhead line would be visible on the skyline and detract from the rural character of the views from the Wolds. The overall magnitude of predicted change is medium. Combined with the landscape's very high value and susceptibility, this would result in a likely significant effect on the part of the RLCT in Section 3.

2.5.23 **PEI Report Volume 2 Part B Chapter 2 Section 4 Landscape** reports likely significant effects on RLCT 7A Chalk Wolds during the operation of Section 4. While the proposed 400 kV overhead line (pylons LW3-LW43 approximately) may be visible in elevated easterly views, the high woodland cover on the lower slopes of the Wolds, between Well and Welton Marsh, would obscure the lower parts of many of the pylons leaving only the upper parts of the lattice structures visible above the trees. Also, the pylons would be located over 4 km away and seen in the context of the large offshore wind turbines at Inner Dowsing Wind Farm, further diminishing the perceived size/scale of change. Although the new 400 kV overhead line may slightly detract from the rural character of existing views from the Wolds, the overall magnitude of the predicted change is small. Combined with the landscape's very high value and sensitivity, this could result in a likely significant effect on the part of the RLCT in Section 4.

2.5.24 When considering the operational phase of the Project in its entirety across all Sections, the overall magnitude of predicted change is medium. Combined with the very high value and susceptibility, the Project would result in a likely significant effect on RLCT 7A Chalk Wolds much of which is within the AONB.

Summary of effects on RLCT 7B Wolds, Scarps, Ridges and Valleys and implications for the AONB

2.5.25 RLCT 7B Wolds, Scarps, Ridges, and Valleys is identified as a landscape of very high value and very high susceptibility. The eastern part of the RLCT is located within the AONB and is characterised by a gentle ridge that slopes down to merge with the flatter, low-lying farmlands within the AONB setting. As the most wooded part of the Wolds, it features large woodland blocks interspersed with cultivated fields. The area has a remote, isolated feel, with ridgetop salters' roads, spring-line villages, and archaeological features adding to its historic character. RLCT 7B Wolds, Scarps, Ridges, and Valleys is only within the Section 4 Study Area of the Project. Consequently, no route-wide assessment was required.

Construction

2.5.26 **PEI Report Volume 2 Part B Chapter 2 Section 4 Landscape** reports no significant effects on RLCT 7A Chalk Wolds during construction of Section 4. While the Project (pylons LW23-LW121 approximately) may be present in elevated views from the south eastern edge of this RCLT, other than some minor road works to facilitate access south along Gunby Lane and the B1195 from the A158, most of the works would be more than 4 km distant. They would be obscured by the small settlements and woodlands which are scattered throughout the intervening farmland. The overall magnitude of predicted change is small. Even given the landscape's high value and very high susceptibility, construction of the Project is unlikely to significantly affect the part of the RLCT in Section 4. This means that there are unlikely to be significant construction effects on the parts of the AONB within RLCT 7B Wolds, Scarps, Ridges and Valleys.

Operation

2.5.27 **PEI Report Volume 2 Part B Section 4 Chapter 2 Landscape** reports no significant effects on RLCT 7A Chalk Wolds during construction of Section 4. While the proposed 400 kV overhead line (pylons LW23-LW121 approximately) may be present in elevated views from the south eastern edge of this RCLT, they would not

fundamentally alter the character or perception of the landscape within the RLCT. This is because the many small woodlands and settlements dispersed throughout the intervening farmland would obscure the lower parts of many of the pylons, leaving only the uppers parts of the lattice structures visible above the trees. Also, the pylons would be located over 4 km away and seen in the context of the large offshore wind turbines at Inner Dowsing and Lynn Wind Farms, further diminishing the perceived size/scale of change.

2.5.28 Although the new 400 kV overhead line may slightly detract from the rural character of views from the Wolds, the overall magnitude of the predicted change is small. Even given the landscape's high value and very high susceptibility, this is unlikely to significantly affect the part of the RLCT in Section 4. This means that there are unlikely to be significant operational effects on the parts of the AONB within RLCT 7B Wolds, Scarps, Ridges and Valleys.

Summary of Preliminary Assessment of Effects on Views to/from the Lincolnshire Wolds

2.5.29 The preliminary assessment of effects on views is reported in **PEI Report Volume 2 Part B Sections 1 – 4 Chapter 3 Visual** by reference to Community Areas[3] and representative Viewpoints, the viewpoint are shown on **PEI Report Volume 2 Part C Figure 2.3 Visual receptors in relation to the Lincolnshire Wolds National Landscape**.

2.5.30 It should be noted that the preliminary assessment for Section 2 is based on the use of low-height pylons between Barnoldby-le-Beck and Waithe (pylons GL18-GL36). This is an embedded mitigation measure to reduce the effects on views from the AONB.

Communities which would experience likely significant effects and implications for the AONB

2.5.31 The following communities offer views into or out of the AONB and are expected to experience likely significant effects during construction and/or operation. For details on the level of effect, the rationale behind each judgment and non-significant effects, please refer to **PEI Report Volume 2 Part B Sections 1-4 Chapter 3 Visual**.

2.5.32 For communities outside the AONB, only those where the Project may significantly affect views towards the AONB are considered. For example, if the Project lies east of a community and the AONB is to the west, views towards the AONB would not be affected, so the community is excluded.

2.5.33 As the Project runs broadly parallel and approximately 2 km to the east of the AONB, it is unlikely to result in significant effects on internal views within the AONB. These are therefore excluded from the appraisal but will be assessed and reported in the ES.

Construction

2.5.34 The communities of Beelsby with Saleby, and Bilsby, have been identified as likely to experience significant effects during construction, primarily due to the development of

[3] The preliminary visual assessment is based on communities within the jurisdiction boundaries of parishes. These are referred to as 'Community Areas'

the LSC-A and LSC-B Substations. The LSC-A Substation, located within Beelsby and Saleby, lies adjacent to large blocks of woodland, which would help to screen construction activity and provide a visual backdrop, meaning most views towards the AONB would not be affected. The LSC-B Substation, situated over 5 km from the AONB within Bilsby, lies to the east of the village, with Bilsby itself located to the west of the Project. As a result, views towards the AONB from the village would not be impacted. While construction activity may be visible from Asserby, this community lies over 6 km away, where the AONB is not a prominent feature in views; therefore, any effects would not be significant. On this basis, construction effects on communities in relation to the AONB are not considered further.

Operation

2.5.35 The following communities have been identified as likely to experience significant effects during the operational phase of the Project. For communities located within the AONB, these 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 400 kV 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.

i. Alvingham (VP185) in Section 2, which is considered to have a high susceptibility to the Project and high value views towards the AONB.

ii. Beesby with Saleby (VP175) in Section 3, which is considered to have a high susceptibility to the Project. Whilst the community has been assessed as having medium value views overall, those from the western part of the community area, closest to the AONB, are judged to be of higher value.

iii. Bilsby in Sections 3 and 4, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

iv. Brisgley in Section 2, which is considered to have a high susceptibility to the Project and high value views towards the AONB.

v. Covenham St Bartholomew (VP189, VP190, VP192) in Section 2, which is considered to have a high susceptibility to the Project. Whilst the community has been assessed as having medium value views overall, those from the western part of the community area, closest to the AONB, are judged to be of higher value.

vi. Covenham St Mary (VP188) in Section 2, which is considered to have a high susceptibility to the Project. Whilst the community has been assessed as having medium value views overall, those from the western part of the community area, closest to the AONB, are judged to be of higher value.

vii. Cumberworth (V163) in Section 4, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

viii. East Ravendale (VP16) in Section 2, which is considered to have a high susceptibility to the Project and high value views and is located within the AONB.

ix. Elkington in Section 2, which is considered to have a high susceptibility to the Project and high value views and is located within the AONB.

x. Fotherby in Section 2, which is considered to have a high susceptibility to the Project and high value views and is partially within the AONB.

xi. Fulstow (V191) in Section 2, which is considered to have a high susceptibility to the Project. Whilst the community has been assessed as having medium value views overall, those from the western part of the community area, closest to the AONB, are judged to be of higher value.

xii. Gayton le Marsh (VP177) in Section 2, which is considered to have a high susceptibility to the Project. Whilst the community has been assessed as having medium value views overall, those from the western part of the community area, closest to the AONB, are judged to be of higher value.

xiii. Great Carlton (VP178) in Section 2, which is considered to have a high susceptibility to the Project. Whilst the community has been assessed as having medium value views overall, those from the western part of the community area, closest to the AONB, are judged to be of higher value.

xiv. Grimoldby (VP181) in Section 2, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

xv. Hannah cum Hagnaby (VP169) in Section 3, which is considered to have a high susceptibility to the Project and medium value views.

xvi. Hawerby cum Beesby in Section 2, which is considered to have a high susceptibility to the Project and high value views and is located within the AONB.

xvii. Holton le Clay in Section 2, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

xviii. Huttoft (VP166, VP167, VP168) in Section 3, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

xix. Little Carlton (VP179) in Section 2, which is considered to have a high susceptibility to the Project. Whilst the community has been assessed as having medium value views overall, those from the western part of the community area, closest to the AONB, are judged to be of higher value.

xx. Markby (VP169, VP170) in Section 3, which is considered to have a high susceptibility to the Project and medium value views.

xxi. North Cockerington (VP183) in Section 2, which is considered to have a high susceptibility to the Project and medium value views.

xxii. North Ormsby in Section 2, which is considered to have a high susceptibility to the Project and high value views and is located within the AONB.

xxiii. North Thoresby in Section 2, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

xxiv. Rigsby with Ailby (VP40) in Section 3, which is considered to have a high susceptibility to the Project and medium value views and is located partially within the AONB.

xxv. South Cockerington (VP182) in Section 2, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

xxvi. Strubby with Woodthorpe (VP174) in Section 2, which is considered to have a high susceptibility to the Project. Whilst the community has been assessed as

having medium value views overall, those from the western part of the community area, closest to the AONB, are judged to be of higher value.

xxvii. Utterby in Section 2, which is considered to have a high susceptibility to the Project and high value views and is located partially within the AONB.

xxviii. Waithe (VP193, VP194) in Section 2, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

xxix. Withern with Stain (VP176) in Section 2, which is considered to have a high susceptibility to the Project and medium value views towards the AONB.

xxx. Wyham cum Cadeby (VP20) in Section 2, which is considered to have a high susceptibility to the Project and high value views and is located partially within the AONB.

xxxi. Yarburgh (VP187) in Section 2, which is considered to have a high susceptibility to the Project and high value views towards the AONB.

2.5.36 The preliminary assessment of effects on Community Areas suggests that there would be likely significant operational effects on views to and from the AONB.

Recreational Routes which would experience likely significant effects and implications for the AONB

2.5.37 Users of the following recreational routes would experience likely significant effects on their sequential views to and/or from the AONB during the construction and operation of the Project. For details on the level of effect and the rationale behind each judgment, refer to **PEI Report Volume 2 Part B Sections 1-4 Chapter 3 Visual**.

Construction

2.5.38 Users of four recreational routes, the Greenwich Meridian Trail, Wanderlust Way, Nev Cole Way, and Silver Lincs Way, were identified as likely to experience significant effects during construction, primarily due to the proximity of these footpaths to the proposed 400 kV overhead line, all of which cross the Project in Section 2. While construction activity would be visible in views towards the AONB, the significant effects are limited to users of the footpaths in close proximity to the works. As such, these are not considered significant in the context of the AONB. For this reason, construction effects on recreational receptors are not considered further in relation to the AONB.

Operation

i. Greenwich Meridian Trail in Section 2, which is considered to have a high value where the footpath passes through the AONB and its setting. Users of the route are highly susceptible to the visual impacts of the Project.

ii. Lincolnshire Wolds Way in Section 2, which is considered to have typically high value views due to its location mainly within the AONB. Users of the route are highly susceptible to visual impacts from the Project.

iii. Lindsey Loop in Section 2, which is considered to have typically high value views due to its location predominately within the AONB. Users of the route are highly susceptible to the visual impacts of the Project.

iv. Wanderlust Way in Section 2, which is considered to have typically high value views where the footpath passes through the AONB and its setting. Users of the route are highly susceptible to the visual impacts of the Project.

v. Nev Cole Way in Section 2, which is considered to have typically high value views in Section 2 where the footpath passes through the AONB and its setting. Users of the route are highly susceptible to visual impacts from the Project.

vi. Silver Lincs Way in Section 2, which is considered to have typically high value views in Section 2 where the footpath passes through the AONB and its setting. Users of the route are highly susceptible to the visual impacts of the Project.

vii. Louth Canal and Louth Canal Walk in Section 2, which is considered to have typically high value views in Section 2 where the footpath and waterway has views towards the AONB. Users of the route are highly susceptible to the visual impacts of the Project.

2.5.39 The preliminary assessment of effects on recreational routes which pass through the AONB or its setting suggests that there would be likely significant operational effects on views to or from the AONB. These views would be experienced sequentially, with the Project becoming visible at multiple points along a route with views changing as the observer moves through the landscape.

Preliminary appraisal of effects on the Special Qualities of the AONB

2.5.40 Table 1 of the AONB Management Plan (Ref 5) outlines the key landscape features that define the natural beauty and distinct sense of place of the Lincolnshire Wolds. These include Landscape Character, Earth Heritage, Biodiversity, Archaeology, and Cultural Associations. Given that the Project would not directly impact the AONB, the only Special Quality anticipated to be significantly affected is Landscape Character. An extract from Table 1, provided in **Table 2.1** at the end of this chapter, outlines the key characteristics that define the Special Quality of Landscape Character. These are its 'scenic beauty and rural charm', 'expansive, sweeping views' and its 'peace and tranquillity'.

2.5.41 The preliminary landscape and visual assessments presented in **PEI Report Volume 2 Part B Sections 1-4 Chapter 2 Landscape** and **PEI Report Volume 2 Part B Sections 1-4 Chapter 3 Visual** consider two key factors:

i. Regional Landscape Character Types (RLCTs):

— these define the distinct landscape characteristics across the AONB and its surrounding areas, enabling an evaluation of how the Project may impact the landscape's overall character.

ii. Visual Impact on Key Views:

— the assessment examines how the Project could affect views from Community Areas and recreational routes, which are important for residents and visitors who experience the landscape from these locations.

2.5.42 Analysis of the preliminary results for these two aspects indicates how the Project may influence the AONB's special quality of Landscape Character as explained below.

2.5.43 Parts of the Project within Sections 1 – 4, are situated within the AONB setting as defined in **PEI Report Volume 3 Part C Appendix 2A Setting Study**. 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. Other parts lie just outside the setting as defined in **PEI Report Volume 3 Part C Appendix 2A Setting Study**.

Landscape effects

2.5.44 Likely significant construction and operational impacts are identified for RLCT 2C: Fen and Marsh Margin Farmlands and RLCT 7A: Chalk Wolds. While the construction effects would be temporary and transient, 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 perceived 'peace and tranquillity' of the AONB, particularly in quieter areas away from major roads, further diminishing the Special Quality of Landscape Character.

Visual effects

2.5.45 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. This includes views to and from the AONB, as referenced in Theme 1 of Section 4 of the AONB Management Plan (Ref 5). This is evidenced by the likely significant operational impacts predicted for the following Community Areas and recreational routes:

i. Alvingham Community Area;

ii. Beesby with Saleby Community Area;

iii. Bilsby Community Area;

iv. Brigsley Community Area;

v. Covenham St Bartholomew Community Area;

vi. Covenham St Mary Community Area;

vii. Cumberworth Community Area;

viii. East Ravendale Community Area;

ix. Elkington Community Area;

x. Farlesthorpe Community Area;

xi. Fotherby Community Area;

xii. Fulstow Community Area;

xiii. Gayton le Marsh Community Area;

xiv. Great Carlton Community Area;

xv. Grimoldby Community Area;

xvi. Hannah cum Hagnaby Community Area;

xvii. Haweby cum Beesby Community Area;

xviii. Holton le Clay Community Area;

xix. Huttoft Community Area;

xx. Little Carlton Community Area;

xxi. North Cockerington Community Area;

xxii. North Ormsby Community Area;

xxiii. North Thoresby Community Area;

xxiv. Rigsby with Ailby Community Area;

xxv. South Cockerington Community Area;

xxvi. Strubby with Woodthorpe Community Area;

xxvii. Utterby Community Area;

xxviii. Waithe Community Area;

xxix. Withern with Stain Community Area;

xxx. Wyham cum Cadeby Community Area;

xxxi. Yarburgh Community Area;

xxxii. Greenwich Meridian Trail;

xxxiii. Lincolnshire Wolds Way;

xxxiv. Lindsey Loop;

xxxv. Wanderlust Way;

xxxvi. Nev Cole Way;

xxxvii. Silver Lincs Way; and

xxxviii. Louth Canal and Louth Canal Walk.

Overview of likely visual effects looking out from the Lincolnshire Wolds AONB

2.5.46 The Project is 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.

2.5.47 Preliminary field surveys along the A18 and A16, which follow the high ground along the eastern side of the AONB, indicate that the Project is likely to be most noticeable from the eastern side of the AONB between East Ravendale and Elkington. These views are currently unaffected by high voltage electricity infrastructure or other discordant features with the exception of some very distant offshore wind turbines. Elsewhere, the intervening landform and woodland would screen most of the new infrastructure from view, particularly south of Louth where woodland cover within the AONB and its setting increases.

2.5.48 The use of low-height pylons along the section of the AONB between Barnoldby le Beck and Waithe would help to reduce their prominence and lessen visual intrusion within the landscape. These pylons are more likely to be seen against a backdrop of low-lying farmland, rather than breaking the skyline or interrupting views of the coastline. While this would result in a lower magnitude of change compared to full-height pylons, the overall effect would still be significant, as outlined in the preliminary assessments summarised above. For more information on pylon choice refer to the **Design Development Report**.

2.5.49 At the southern end of the AONB, where the A16 and Bluestone Heath Road (A1028) descend the ridgeline, approximately 1–2 km of the new 400 kV overhead line would be visible in direct views. However, as the pylons would be seen from over 5 km away from the AONB and set against the landform, their visual impact would be diminished. The assessment of effects on the Candlesby with Gunby and Welton Le Marsh community areas in Section 4 recorded no significant effects.

Overview of likely visual effects looking towards the Lincolnshire Wolds AONB

2.5.50 While views towards the AONB are not listed as a Special Quality, they are referenced in Theme 1 of Section 4 in the AONB Management Plan (Ref 5) and in the Protected Landscapes Guidance (Ref 4). They are therefore a key consideration in the Landscape and Visual Assessment of the Project.

2.5.51 The eastern side of the Lincolnshire Wolds rises gently above the surrounding lower-lying farmland and is not a dominant physiographic feature. Rather than a pronounced change in slope, the most noticeable transition is in landcover, from large-scale arable farmland with woodland to smaller-scale pastoral farmland. Additionally, the extensive woodland cover immediately east of the A18/A16 obscures many views of the Lincolnshire Wolds, particularly south of Louth.

2.5.52 Where pylons are clearly visible in views towards the AONB, particularly in close proximity, the effects are likely to be significant. The only area where these effects would be moderated is around Barnoldby le Beck and Laceby, where existing overhead lines and other infrastructure are already present.

Summary

2.5.53 AONB are designated under Section 82 of the CRoW Act for the statutory purpose of conserving and enhancing their natural beauty. Public bodies and statutory undertakers, including National Grid have a duty to ‘seek to further the statutory purposes’ of AONB in decision making.

2.5.54 The incorporation of low-height pylons between Barnoldby le Beck and Waithe would reduce the prominence of the new 400 kV overhead line, ensuring that the views from the AONB to this part of the Project are less affected.

2.5.55 Locating LCS-A Substation close to existing woodland would offer immediate natural screening and help to integrate the substation into the surrounding landscape. In the longer term, proposed woodland and tree planting along field boundaries around both of the new Lincolnshire Connection Substations would provide additional screening. This would further reduce potential visual effects on the AONB and support the integration of the infrastructure into the wider landscape setting.

2.5.56 Nevertheless, given the Project’s proximity to the AONB and its partial location within the AONB’s setting, significant construction and operational impacts on the special

quality of Landscape Character are likely. This is due to the effects on views to and from the AONB, resulting in indirect impacts on the visual experience, sense of place, and overall landscape character of the AONB.

2.5.57 The likely significant effects would be limited to sections of the eastern part of the AONB. Views looking north, west, and south from the AONB are not expected to experience significant effects.

Table 2.1 The Special Qualities of the Lincolnshire Wolds AONB (extracted from the Lincolnshire Wolds Area of Outstanding Natural Beauty Management Plan (Ref 5))

Special Quality (Importance to natural beauty)	LLCA4 - Quality and Extent				Condition	Pressures and Trends	Management Options
Landscape Character	**Chalk Wolds**	**Ridges and valleys of the south-west scarp**	**South-eastern claylands**	**Total extent within AONB**			
Scenic beauty and rural charm	General component - a rolling upland landscape of strongly cohesive identity with farming as an underlying component			Most of AONB	Good, but needs quantitative survey (see monitoring section)	Changes in land management and the future use of farm buildings; decoupling from CAP; quarrying; telecommunication masts; wind farm developments including periphery of AONB; oil exploration; light pollution; solar, anaerobic and other alternative energy schemes.	Planning and development management; interpretation and education; liaison with community and visitors; national and local funding opportunities through agri-environment schemes, Lottery funding etc.
Expansive, sweeping views	General component – views from scarp edge, High Street and Bluestone Heath Road are particularly dramatic			Most of AONB	Good, but needs quantitative survey (see monitoring section)	As above, but particularly potential from intrusion from hilltop or skyline developments including overhead powerlines.	Planning and development management; high quality design and build; landscaping.

[4] The North-west scarp LLCA is not included in the assessment as it is not close to the Project and would not experience any effects.

Special Quality (Importance to natural beauty)	LLCA4 - Quality and Extent		Condition	Pressures and Trends	Management Options
					Undergrounding overhead wires initiative.
Peace and tranquillity	General component – once away from the main roads, there is a wide sense of remoteness and rural isolation accentuated by the combination of elevated plateau and sheltered coombes.	Most of AONB	Good, away from main roads such as A16, A18 and High Street	Continued increase in road freight and possible increase in air traffic (via Humberside Airport and armed services); light pollution; unmanaged visitor pressure.	Integrated public transport initiatives.

References

Ref 1 UK Government (2025) Countryside and Rights of Way Act 2000. Available at https://www.legislation.gov.uk/ukpga/2000/37/contents [Accessed 18 March 2025].

Ref 2 The Planning Inspectorate (2024). Scoping Opinion: Proposed Grimsby to Walpole Project [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000109-Scoping%20Opinion%202017%20EIA%20Regs.pdf [Accessed 20 March 2025].

Ref 3 National Grid Electricity Transmission (2024). Grimsby to Walpole Environmental Impact Assessment Scoping Report [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000004-EN020036%20-%20Scoping%20Report%20Volume%201%20Main%20Report.pdf [Accessed 20 March 2025].

Ref 4 Department for Environment Food and Rural Affairs (2024) *Guidance for relevant authorities on seeking to further the purposes of Protected Landscapes* [online] Available at https://www.gov.uk/government/publications/the-protected-landscapes-duty/guidance-for-relevant-authorities-on-seeking-to-further-the-purposes-of-protected-landscapes [Accessed 18 March 2025].

Ref 5 Lincolnshire Wolds Countryside Service and Lincolnshire Wolds Joint Advisory Committee (2018). Lincolnshire Wolds Area of Outstanding Natural Beauty Management Plan. Available at https://www.lincswolds.org.uk/our-work/management-plan [Accessed 18 March 2025].

Ref 6 Natural England (2010). East Midlands Region Landscape Character Assessment [online]. Available at: https://publications.naturalengland.org.uk/publication/5635681403535360#:~:text=The%20East%20Midlands%20Region%20Landscape,distinctive%2C%20rare%20or%20special%20characteristics [Accessed 18 March 2025].

3. Ecology and Biodiversity

nationalgrid

Contents

3. Ecology and Biodiversity

3.1 Introduction

3.1.1 This chapter presents an assessment of the route-wide preliminary impacts and likely significant effects of Grimsby to Walpole Project (the Project) on ecological resources in accordance with **Preliminary Environmental Information (PEI) Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Impacts and significant effects of the Project on ecological receptors at a Section-level are reported in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity**.

3.1.2 This chapter specifically provides a preliminary assessment of the potential route-wide impacts and likely significant effects on the following ecological receptors:

i. sites statutorily designated for their international and national nature conservation importance (which includes those that extend across multiple Sections of the Project).

ii. sites non-statutorily designated for their biodiversity value.

iii. aquatic and terrestrial habitats (including Habitats of Principle Importance (HPIs)) present within the Ecology and Biodiversity Study Area.

iv. protected and notable species which are either confirmed present or potentially present within the Project Survey Area which could be impacted through habitat loss or degradation, disturbance (e.g. due to noise or light pollution) or killing/injury. Species considered are:

- terrestrial invertebrates;
- great crested newt (GCN);
- reptiles;
- breeding and wintering birds;
- badger;
- bats;
- otter;
- water vole;
- fish;
- aquatic macroinvertebrates and macrophytes; and
- other notable species such as brown hare or hedgehog.

v. invasive non-native species (INNS).

3.1.3 As detailed in **Table 3.1 – Table 3.4** below, many of the statutory and non-statutory designated sites, aquatic and terrestrial habitats and protected and notable species

identified within PEI Report Volume 2 Part B are located within the Study Areas for more than one Section of the Project. A detailed a cross-Sectional assessment of the potential route-wide impacts upon these statutory and non-statutory designated sites that report potential effects in multiple Sections of the Project is therefore required. This will however be included within the Environmental Statement (ES) submitted with the Development Consent Order (DCO) application when all required baseline surveys are complete, as at this PEI Report stage, the assessments presented are likely to be subject to change as more detailed baseline data becomes available.

3.1.4 The conclusions of the preliminary assessment of impacts and likely significant effects on ecological resources conducted within **PEI Report Volume 2 Part B Chapter 4 Ecology and Biodiversity Sections 1-7** are based on surveys completed to date. Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES submitted with the DCO application. On this basis, a precautionary approach has been taken to the preliminary assessment.

3.1.5 The Survey Areas and Study Areas for ecological receptors are summarised in **Preliminary Environmental Information (PEI) Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope.**

3.1.6 The potential for preliminary impacts and likely significant effects upon Ancient Woodland is considered at a Section-level in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity**. However, Ancient Woodland is either not present within the Study Area of the relevant Section or no potential for direct or indirect effects upon Ancient Woodland are found. Therefore, it is not considered further within this chapter. Please note that the Study Areas for designated sites and ancient woodland and HPIs are different and as such, some habitats identified and reported under designated sites may not be reported under headings for habitats.

3.1.7 Embedded measures to avoid or reduce impacts on ecological receptors considered in this chapter include designing the draft Order Limits and Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) to avoid statutory and non-statutory designated sites of ecological importance, habitats of principal importance and protected and notable species as far as practicable. Control and management measures to mitigate against construction related disturbance considered in this chapter are outlined within the Preliminary Code of Construction Practice (CoCP) provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. Additional mitigation measures, which are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures, are in the early stages of development at this PEI Report stage and will be finalised and detailed within the ES once all required baseline surveys are complete. Therefore, the likely significant effects summarised within this chapter take into account the embedded mitigation and control and management measures detailed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity** only.

3.1.8 The Project is committed to delivering Biodiversity Net Gain (BNG) for the Project as previously highlighted during scoping. It is anticipated that BNG delivery will become mandatory under the Environment Act 2021 (which requires a 10 per cent increase from the baseline) for DCO applications from November 2025. UK Habitat (UKHab) Classification surveys (Ref 1) and BNG unit calculations are ongoing following a staged approach to assessment in order to inform the design and discussions on

ecological compensation in line with the Biodiversity Gain Hierarchy. However, it is acknowledged that the government's consultation on this element has not yet commenced and therefore the approach to BNG assessment and delivery will be kept under review and the final BNG approach for the Project will be revised in line with the latest guidance.

3.2 Route-wide Summary of Effects

Statutory Designated Sites

Designated sites of international nature conservation importance

3.2.1 There are nine designated sites of international nature conservation importance that are located within the desk Study Areas (hereafter referred to as 'the Study Areas') of the Project that are relevant to the assessment conducted within **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity.** A preliminary assessment of the potential route-wide effects on these designated sites of international nature conservation importance during construction considered in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity** is provided in Table 3.1**,** and a preliminary assessment of potential effects during operation is provided in **Table 3.2** below:

3.2.2 Each designated site is listed in the table under the Section heading of where it is first identified within PEI Report Volume 2 Part B. For the eight designated sites that are located within the Study Areas for more than one Section, this is detailed in the tables below.

Table 3.1 Preliminary assessment of potential effects upon designated sites of international nature conservation importance that are located within the Study Areas of the Project during construction

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
Section 1 New Grimsby West Substation					
Humber Estuary (also located within Study Area for Sections 2, 3 and 4).	Special Protection Area (SPA),	Designated for its qualifying features being breeding, non-breeding birds and waterbird assemblages with large foraging ranges.	Loss of Functionally linked land (FLL)[1], noise and visual disturbance within FLL, changes in water quality and flow and atmospheric pollution.	The standard pollution prevention measures (such as GG15, GG16, GG17 and W01 to W11) that will be implemented and secured by the CoCP aim to reduce potential impacts upon water quality. Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES and Report to Inform Habitats Regulations Assessment (HRA).	Significant effects cannot be excluded at this stage in the assessment. The potential for Likely Significant Effects (LSE) upon these sites will be assessed within the Report to Inform HRA (to be submitted with the ES).
	Special Area of Conservation (SAC)	Designated for Annex I habitats and Annex II species including river lamprey and sea lamprey which undertake upstream migrations to reach suitable spawning habitats.	Works within or adjacent to watercourses which are hydrologically linked to the Humber Estuary could impact lamprey species.		
	Ramsar Site	Designated under Ramsar Criterion 1 (Estuary), 3 (Grey seal – breeding and Natterjack toad), 5 (Assemblages of international importance), 6 (species/populations occurring at levels of international importance including passage and wintering birds) and 8 (river lamprey, sea lamprey).	Loss of FLL, noise and visual disturbance within FLL, changes in water quality and flow and atmospheric pollution. Works within or adjacent to watercourses which are hydrologically linked to the Humber Estuary could impact lamprey species.		

[1] 'Functionally linked land' is a term often used to describe areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season of a qualifying feature for which a SAC/SPA/Ramsar site has been designated.

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A					
The Wash (also located within Study Area for Sections 3 and 4).	SPA	Designated for its qualifying features being non-breeding birds and waterbird assemblages with large foraging ranges.	Loss of FLL, noise and visual disturbance (in functionally linked habitat), changes in water quantity, level and flow.	The standard pollution prevention measures (such as GG15, GG16, GG17 and W01 to W11) that will be implemented and secured by the CoCP aim to reduce potential impacts upon water quality. Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES and Report to Inform HRA.	Significant effects cannot be excluded at this stage in the assessment. The potential for LSEs upon these sites will be assessed within the Report to Inform HRA (to be submitted with the ES).
	Ramsar site	Designated under Ramsar Criterion 1 (Estuary), 3 (Grey seal – breeding and Natterjack toad), 5 (Assemblages of international importance), 6 (species/populations occurring at levels of international importance including passage and wintering birds).	Loss of FLL, noise and visual disturbance (in functionally linked habitat), changes in water quantity, level and flow.		
Greater Wash (also located within Study Area for Sections 3 and 4).	SPA	Designated for its qualifying features being breeding, non-breeding birds and waterbird assemblages with large foraging ranges.	Loss of FLL, noise and visual disturbance (in functionally linked habitat), changes in water quantity, level and flow.		
Saltfleetby - Theddlethorpe Dunes (and Gibraltar Point) (also located within Study	SAC	Designated for its dune habitats	Potential changes in water quantity, level and flow.		

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
Area for Section 3).					
Gibraltar Point (also located within Study Area for Sections 3 and 4).	SPA	Designated for its qualifying features being breeding, non-breeding birds and waterbird assemblages with large foraging ranges.	Potential changes in hydrology to impact functionally linked habitats. The Gibraltar Point SPA and Ramsar site include birds as qualifying features. The Project falls beyond the core foraging ranges of all qualifying species, many of which are also more tightly associated with coastal rather than inland FLL and no LSE are anticipated. The potential for changes in hydrology to impact functionally linked habitats will be assessed within the Report to Inform HRA and significant effects cannot be excluded at this stage in the assessments.		
	Ramsar Site	Designated under Ramsar Criterion 1 (Coastal dunes and saltmarsh habitats, including freshwater marsh), 2 (Wetland invertebrate assemblage), 5 (Assemblages of international importance, specifically species with peak counts in winter), 6 (Species/populations occurring at levels of international importance).			
Section 3 New Lincolnshire Connection Substations A and B					
No additional Designated Sites are first identified within the Study Area for Section 3 (as per the rows above, Humber Estuary SPA, SAC and Ramsar Site, Saltfleetby - Theddlethorpe Dunes (and Gibraltar Point) SAC, Gibraltar Point SPA and Ramsar Site are located within Study Area for Section 3).					

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone					
The Wash and North Norfolk (also located within Study Area for Section 5, 6, 7).	SAC	Designated for its habitats such as seedbanks, mudflats and coastal lagoons and also includes otters as qualifying features	Changes in water quantity, level and flow and works within or adjacent to watercourses which are hydrologically linked to the SAC have the potential to impact otter species.	The standard pollution prevention measures (such as GG15, GG16, GG17 and W01 to W11) that will be implemented and secured by the CoCP aim to reduce potential impacts upon water quality. Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES and Report to Inform HRA.	Significant effects cannot be excluded at this stage in the assessment. The potential for LSEs upon these sites will be assessed within the Report to Inform HRA (to be submitted with the ES).
Nene Washes (also located within Study Area for Sections 5, 6 and 7).	SPA	Designated for its qualifying features being breeding, non-breeding birds and waterbird assemblages with large foraging ranges.	Potential disturbance and/or loss of functionally linked habitat		
	Ramsar Site	Designated under Ramsar Criterion 2 (important assemblage of nationally rare breeding birds, wide range of raptors throughout the year, nationally scarce plants and invertebrates) and 6 (species/populations occurring at levels of international importance).			
Section 5 Refined Weston Marsh Substation Siting Zone					
No additional Designated Sites are first identified within the Study Area for Section 5 (as per the rows above, The Wash and North Norfolk SAC and Nene Washes SPA and Ramsar Site are located within Study Area for Section 5).					

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation					
Ouse Washes (also located within Study Area for Section 7).	SPA	Designated for its qualifying features being breeding, non-breeding birds and waterbird assemblages with large foraging ranges.	Potential disturbance and/or loss of functionally linked habitat	The standard pollution prevention measures (such as GG15, GG16, GG17 and W01 to W11) that will be implemented and secured by the CoCP aim to reduce potential impacts upon water quality. Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES and Report to Inform HRA.	Significant effects cannot be excluded at this stage in the assessment. The potential for LSEs upon these sites will be assessed within the Report to Inform HRA (to be submitted with the ES).
	Ramsar site	Designated under Ramsar Criterion 1 (one of the most extensive areas of seasonally-flooding washland of its type in Britain), 2 (the site supports several nationally scarce plants and breeding waterfowl), 5 (Assemblages of international importance), 6 (species/populations occurring at levels of international importance).			
Section 7 New Walpole B Substation					
No additional Designated Sites are first identified within the Study Area for Section 7 (as per the rows above, The Wash and North Norfolk SAC, Nene Washes SPA and Ramsar Site and Ouse Washes SPA and Ramsar Site are located within Study Area for Section 7).					

Table 3.2 Preliminary assessment of potential effects upon designated sites of international nature conservation importance that are located within the Study Areas of the Project during operation and maintenance

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
Section 1 New Grimsby West Substation					
Humber Estuary (also located within Study Area for Sections 2, 3 and 4).	SPA	*Reasons for designation listed in* **Table 3.1** *above.*	Potential for collision mortality (killing/injury of bird species which are qualifying features) to occur.	Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES and the Report to Inform HRA. During operation of the Project, National Grid Electricity Transmission plc (National Grid) operatives will adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes). National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly.	Significant effects cannot be excluded at this stage in the assessment. The potential for LSEs upon these sites will be assessed within the Report to Inform HRA (to be submitted with the ES).
	Ramsar Site				
	SAC		Potential for altered flow regimes that can directly affect the qualifying habitats, and hydrological changes may impact SAC/SPA species indirectly.		
Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A					
The Wash (also located within Study Area for	SPA	*Reasons for designation listed in* **Table 3.1** *above.*	Potential for collision mortality (killing/injury of bird species which are qualifying features) to occur.	Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES and the Report to Inform HRA.	Significant effects cannot be excluded at this stage in the assessment. The potential for LSEs upon these sites will be assessed within the
	Ramsar site				

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
Sections 3 and 4).				During operation of the Project, National Grid operatives will adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes). National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly.	Report to Inform HRA (to be submitted with the ES).
Section 3 New Lincolnshire Connection Substations A and B					
No additional Designated Sites are first identified within the Study Area for Section 3S (as per the rows above, Humber Estuary SAC, SPA and Ramsar Site are located within Study Area for Section 3).					
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone					
Gibraltar Point	SPA	*Reasons for designation listed in* **Table 3.1** *above*	Potential for collision mortality (killing/injury of bird species which are qualifying features) to occur.	Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES and the Report to Inform HRA. During operation of the Project, National Grid operatives will adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).	Significant effects cannot be excluded at this stage in the assessment. The potential for LSEs upon these sites will be assessed within the Report to Inform HRA (to be submitted with the ES).
	Ramsar Site				
Greater Wash	SPA				
Nene Washes (also located within Study Area for	SPA				
	Ramsar Site				

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
Section 5, 6 and 7)				National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly.	
Section 5 Refined Weston Marsh Substation Siting Zone					
The Wash and North Norfolk Coast (also located within Study Area for Section 6 and 7)	SAC	*Reasons for designation listed in* **Table 3.1** *above.*	Potential for altered flow regimes that can directly affect the qualifying habitats, and hydrological changes may impact SAC/SPA species indirectly.	Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES and the Report to Inform HRA. During operation of the Project, National Grid operatives will adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes). National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly.	Significant effects cannot be excluded at this stage in the assessment. The potential for LSEs upon these sites will be assessed within the Report to Inform HRA (to be submitted with the ES).
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation					
Ouse Washes	SPA Ramsar site	*Reasons for designation listed in*	Potential for collision mortality (killing/injury of bird species which	Seasonal survey work will continue in 2025 to inform the assessment of impacts and any appropriate mitigation and	Significant effects cannot be excluded at this stage in the assessment. The

Designated Site	Designation type	Reason for designation	Potential Impact	Mitigation	Likely Significance of effect
(also located within Study Area for Section 7).		**Table 3.1** *above*	are qualifying features) to occur.	enhancement, which will be developed fully and presented within the ES and the Report to Inform HRA. During operation of the Project, National Grid operatives will adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes). National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly.	potential for LSEs upon these sites will be assessed within the Report to Inform HRA (to be submitted with the ES).
Section 7 New Walpole B Substation					
No additional Designated Sites are first identified within the Study Area for Section 7 (as per the rows above, The Wash SPA and Ramsar Site, Nene Washes SPA and Ramsar Site, Ouse Washes SPA and Ramsar Site, and The Wash and North Norfolk Coast SAC are located within Study Area for Section 7).					

Designated sites of national nature conservation importance

3.2.3 There are 32 designated sites of national nature conservation importance that are located within the Study Area of the Project (within 5 km of the draft Order Limits and Refined Siting Zone and/or where the Site of Special Scientific Interest (SSSI) Impact Risk Zones (IRZ's) overlap up to 5 km from the draft Order Limits and Refined Siting Zone) that are relevant to the assessment conducted within **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity**. A preliminary assessment of the potential route-wide effects on these designated sites of national nature conservation importance during construction considered in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity** is provided in **Table 3.3**, and a preliminary assessment of potential effects during operation is provided in **Table 3.4** below:

3.2.4 As with **Table 3.1** and **Table 3.2**, each designated site is listed under the Section heading of where it is first identified within PEI Report Volume 2 Part B. For designated sites that are located within the Study Areas for more than one Section, this is detailed in tables below.

Table 3.3 Preliminary assessment of potential effects upon designated sites of national nature conservation importance that are located within the Study Areas of the Project during construction

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
Section 1 New Grimsby West Substation					
Humber Estuary (also located within Study Area for Section 2).	SSSI	Designated for habitats such as estuary, intertidal mudflats, sandflats and coastal marsh, saline lagoons and sand dunes as well its populations of waterfowl, waders, grey seals, lamprey, plant and invertebrate assemblages.	Potential impacts upon habitats as a result of pollution from hydrological links between the Project and this SSSI	Pollution prevention measures secured by the CoCP.	Significant effects cannot be excluded at this stage in the assessment.
			Potential impacts upon bird assemblage of the SSSI that may use habitats within the wider area for foraging where there is potential for some of the land to be functionally linked. River lamprey and sea lamprey may be present within hydrologically linked watercourses.	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be developed fully and presented within the ES.	Significant effects cannot be excluded at this stage in the assessment.
Bradley and Dixon Woods	Local Nature Reserve (LNR)	An ancient woodland. Meadow areas present along with ponds.	Habitat loss	Due to the distance of the LNR from the Section 1 draft Order Limits, no habitat loss is anticipated	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
(also located within Study Area for Section 2).			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
Freshney Parkway (also located within Study Area for Section 2).	LNR	Predominantly meadow with wildflowers and areas of tree plantations	Habitat loss	Due to the distance of the LNR from the Section 1 and 2 draft Order Limits, no habitat loss is anticipated.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality.	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
Section 2 New Grimsby West Substation to Lincolnshire Connection Substation A					
Muckton Wood	SSSI	Designated for its primary woodland and notable large heronry.	Potential impacts upon herons that may use habitats within the wider area for foraging (potential for some of the land to be functionally linked), and potential impacts upon the bird	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be developed fully	Significant effects cannot be excluded at this stage in the assessment.

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
			assemblage, during construction.	and presented within the ES.	
Swallow Wold	SSSI	A glacial meltwater channel valley cut into Wold chalk with deposits of bedded sands with frog orchid present on the site and one southern slope being important for common blue butterfly. Linnet is noted to breed on the site.	Habitat loss	Due to the distance of the SSSI from the Section 2 draft Order Limits, no habitat loss is anticipated.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality during construction.	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
Tetney Blow Wells	SSSI	Designated for its reedbeds, base-rich fen and swamp vegetation.	No potential impacts during construction or operation.	Due to the distance of the SSSI from the Section 2 draft Order Limits, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects.	Not significant
Weelsby Woods Park	LNR	Council managed woodland area containing ornamental trees. Native trees occur in the marginal	Habitat loss	Due to the distance of the SSSI from the Section 2 draft Order Limits, no habitat loss is anticipated.	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
		woodland along with interesting ground flora.	Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality during construction.	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
			No potential impacts during operation.	Due to the distance of the SSSI from the Section 2 draft Order Limits, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects.	Not significant
Claceby Marsh (also located within Study Area for Section 3).	SSSI	Designated for its base-rich marsh.	No potential impacts during operation.	Due to the distance of the SSSI from the Section 2 draft Order Limits, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects.	Not significant
Saltfleetby - Theddlethorpe Dunes	SSSI	Designated for its flats, dunes, salt and freshwater marsh and rich flora and	Potential changes in water quantity, level and flow during construction.	Assessment of impacts and any appropriate mitigation and enhancement measures	Significant effects cannot be excluded at this stage in the assessment.

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
(also located within Study Area for Section 3).		fauna (including breeding birds).		will be developed within the Report to Inform HRA.	
Swaby Valley (also located within Study Area for Section 3).	SSSI	A glacial overflow valley supporting two habitats now scarce in Lincolnshire: floristically diverse, lime-rich marsh and unimproved chalk turf.	Habitat loss	Due to the distance of the LNR from the Section 2 and 3 draft Order Limits, no habitat loss is anticipated.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
			No potential impacts during operation.	Due to the distance of the SSSI from the Section 2 and 3 draft Order Limits, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects.	
South Thoresby Warren	LNR	Early successional grassland with young plantation. This former landfill site has been transformed into an area	Habitat loss	Due to the distance of the LNR from the Section 2 and 3 draft Order Limits, no habitat loss is anticipated.	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
(also located within Study Area for Section 3).		for both people and wildlife.	Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
			No potential impacts during operation.	Due to the distance of the LNR from the Section 2 and 3 draft Order Limits, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects.	
Section 3 New Lincolnshire Connection Substations A and B					
Hoplands Wood (also located within Study Area for Section 4).	SSSI	Area of Ancient Woodland with diverse ground flora and breeding bird community.	Habitat loss.	Due to the distance of the SSSI from the Section 3 and 4 draft Order Limits, no habitat loss is anticipated.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
			No potential impacts during operation in Section 3.	Due to the distance of the SSSI from the Section 3 draft Order Limits, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects.	
			Potential contamination during maintenance works in Section 4	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
Willoughby Meadow (also located within Study Area for Section 4).	SSSI	Meadow of permanent unimproved neutral grassland with well over one hundred species have been recorded from its small acreage.	Habitat loss.	Due to the distance of the SSSI from the Section 3 and 4 draft Order Limits, no habitat loss is anticipated.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
			No potential impacts during operation in Section 3.	Due to the distance of the SSSI from the Section 3 draft Order Limits, and also the lack of ecological or	

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
				hydrological connectivity, there is not considered to be a pathway to effects.	
			Potential contamination during maintenance works in Section 4.	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
Willoughby Branch Line (also located within Study Area for Section 4).	LNR	Disused branch railway line now made up of ash, hawthorn scrub and grassland that supports a range of flora and fauna such as birds and butterflies.	Habitat loss.	Due to the distance of the LNR from the Section 3 draft Order Limits, no habitat loss is anticipated.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	
			No potential impacts during operation in Section 3.	Due to the distance of the LNR from the Section 3 draft Order Limits, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects.	

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
			Potential adverse effects on habitats (habitat loss and/or degradation) as well as potentially any fauna (e.g. bats, otter and water vole) during construction of Section 4.	Further survey work will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be developed fully and presented within the ES.	Significant effects cannot be excluded at this stage in the assessment.
			Contamination during maintenance works in Section 4.	Implementation of pollution prevention measures (such as GG15, GG16, GG17).	Not significant
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone					
Candlesby Hill	SSSI	Chalk grassland and broadleaved woodland	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
Bratoft Meadows (Heaths Meadows Local Wildlife Site (LWS))	SSSI	Grassland habitats	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	Not significant
Willoughby Wood	SSSI	Area of Ancient Woodland	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
Claxby Chalk Pit	SSSI	Chalk grassland	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	Not significant
Gibraltar Point	SSSI	Coastal habitats and fauna, including passage and breeding birds	Potential loss of FLL used by foraging birds.	Potential impacts upon the bird assemblage will be assessed once all baseline surveys are complete and will be reported within the ES.	Significant effects cannot be excluded at this stage in the assessment.
Chapel Point to Wolla Bank	SSSI	Coastal habitats	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust,	The likelihood of contamination is considered to be minimal assuming	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
			changes in water quality	appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	
Sea Bank Clay Pits	SSSI	Wetland habitats	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	Not significant
Skendleby Psalter Banks	SSSI	Species-rich unimproved grassland habitat	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust,	The likelihood of contamination is considered to be minimal assuming	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
			changes in water quality	appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	
Jenkins Carr	SSSI	Woodland and wetland habitats	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	Not significant
Keal Carr	SSSI	Base-rich springline alder woodland.	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust,	The likelihood of contamination is considered to be minimal assuming	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
			changes in water quality	appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	
Troy Wood	SSSI	Woodland habitat and breeding heron	Potential loss of FLL. Herons may use these habitats within the wider area for foraging.	Potential impacts upon the bird assemblage will be assessed once all baseline surveys are complete and will be reported within the ES	Significant effects cannot be excluded at this stage in the assessment.
Gibraltar Point	NNR	Sand dune and salt marsh habitats.	Habitat loss and/or degradation and potential adverse effects on fauna.	Further survey work will establish the nature and importance of any receptors associated with the LNR that may be affected by the works.	Significant effects cannot be excluded at this stage in the assessment.
Surfleet Lows (also located within Study Area for Section 5 and 6).	SSSI	Wet meadow habitats	Habitat loss	Due to the distance from the Order Limits of Section 4 and nature of the designation, there will be no habitat loss.	Not significant
			Contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
				control measures Pollution prevention measures such as GG15, GG16, GG17).	
The Wash (also located within Study Area for Section 5 and 6).	SSSI	Wetland habitats and bird assemblage	Disturbance of bird species which form part of the SSSI assemblage could also occur due to construction activities within any functionally linked areas.	Potential impacts upon the bird assemblage will be assessed once all baseline surveys are complete and will be reported within the ES	Significant effects cannot be excluded at this stage in the assessment.
Section 5 Refined Weston Marsh Substation Siting Zone					
Vernatts (also located within Study Area for Section 6)	LNR	Woodland habitats	Habitat loss changes in air quality, dust, changes in water quality	Due to the distance of Vernatts LNR from Section 5 there will be no loss of habitat. Vernatts LNR is located upstream of Section 5 and no ecological or hydrological links are identified.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention	Not significant

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
				measures such as GG15, GG16, GG17) are implemented.	
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation					
The Shrubberies	LNR	Grassland, woodland and pond habitats	Habitat loss changes in air quality, dust, changes in water quality	Due to the distance from the Order Limits of Section 6 there will be no habitat loss within the LNR.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	Not significant
Islington Heronry (also located within Study Area or Section 7	SSSI	Isolated stand of mature oak trees surrounded by fenland which supports the largest colony of grey herons (*Ardea cinerea*) in Norfolk.	Potential impacts upon herons that may use habitats within the wider area for foraging (potential for some of the land to be functionally linked).	Potential impacts upon the bird assemblage will be assessed once all baseline surveys are complete and will be reported within the ES.	Significant effects cannot be excluded at this stage in the assessment.
Section 7 New Walpole B Substation					

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
Wiggenhall St Germans	SSSI	A sequence of deposits dominated by fine-grained clastic sediments intercalated by three peat layers and with a thin basal peat.	Habitat loss changes in air quality, dust, changes in water quality.	Due to the nature of the designation and distance of these sites from the draft Order Limits of Section 7 there will be no habitat loss within the SSSI.	Not significant
			Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality.	The likelihood of contamination is considered to be minimal assuming appropriate management (such as control measures Pollution prevention measures such as GG15, GG16, GG17).	Not significant

Table 3.4 Preliminary assessment of potential effects upon designated sites of national nature conservation importance that are located within the Study Areas of the Project during operation and maintenance

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
Section 1 New Grimsby West Substation					
Humber Estuary (also located within Study Area for Section 2).	SSSI	Designated for habitats such as estuary, intertidal mudflats, sandflats and coastal marsh, saline lagoons and sand dunes as well its populations of waterfowl, waders, grey seals, lamprey, plant and invertebrate assemblages.	Potential for collision mortality (killing/injury of bird species which are qualifying features) to occur.	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be developed fully and presented within the ES.	Significant effects cannot be excluded at this stage in the assessment.
Section 2 New Grimsby West Substation to Lincolnshire Connection Substation A					
Muckton Wood	SSSI	Designated for its primary woodland and notable large heronry.	Potential for collision mortality (killing/injury of bird species which are qualifying features) to occur.	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be developed fully and presented within the ES and the Report to Inform HRA.	Significant effects cannot be excluded at this stage in the assessment.
Saltfleetby - Theddlethorpe Dunes	SSSI	Designated for its flats, dunes, salt and freshwater marsh and rich flora and fauna	Potential for collision mortality (killing/injury of bird species which are	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be	Significant effects cannot be excluded at this

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
(also located within Study Area for Section 3).		(including breeding birds).	qualifying features) to occur.	developed fully and presented within the ES and the Report to Inform HRA.	stage in the assessment.
Section 3 New Lincolnshire Connection Substations A and B					
No additional likely significant effects are predicted for any additional Designated Sites that are first found within the Study Area for Section 3.					
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone					
Gibraltar Point	SSSI	Coastal habitats and fauna, including passage and breeding birds	Potential for collision mortality (killing/injury of bird species which are qualifying features) to occur.	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be developed fully and presented within the ES and the Report to Inform HRA.	Significant effects cannot be excluded at this stage in the assessment.
Troy Wood	SSSI	Woodland habitat and breeding heron	Potential for collision mortality (killing/injury of bird species which are qualifying features) to occur.	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be developed fully and presented within the ES and the Report to Inform HRA.	Significant effects cannot be excluded at this stage in the assessment.
The Wash (also located within Study	SSSI	Wetland habitats and bird assemblage	Potential for collision mortality (killing/injury of bird species which are	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and	Significant effects cannot be excluded at this

Designated Site	Designation type	Reason for designation/description of the site	Potential Impact	Mitigation/Rationale	Likely Significance of effect
Area for Section 5 and 6).			qualifying features) to occur.	enhancement measures will be developed fully and presented within the ES and the Report to Inform HRA.	stage in the assessment.
Section 5 Refined Weston Marsh Substation Siting Zone					
No additional likely significant effects are predicted for any additional Designated Sites that are first found within the Study Area for Section 5.					
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation					
Islington Heronry (also located within Study Area or Section 7	SSSI	Isolated stand of mature oak trees surrounded by fenland which supports the largest colony of grey herons (*Ardea cinerea*) in Norfolk.	Potential for collision mortality (killing/injury of bird species which are qualifying features) to occur.	Once all baseline surveys are complete, this will inform the assessment of impacts and any appropriate mitigation and enhancement measures will be developed fully and presented within the ES and the Report to Inform HRA.	Significant effects cannot be excluded at this stage in the assessment.
Section 7 New Walpole B Substation					
No additional likely significant effects are predicted for any additional Designated Sites that are first found within the Study Area for Section 7.					

Non-statutory Designated Sites

Non-statutory designated sites of nature conservation value

3.2.5 Non-statutory local conservation sites that are within 2 km of the Study Area of the Project may be affected by the Project through loss and/or fragmentation effects upon these local conservation sites or the fauna associated with them, as reported in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity.** These non-statutory designated sites, divided into LWS, County Wildlife Sites (CWS) and Roadside Nature Reserves (RNR), all of which are of County importance, are summarised in **Table 3.5** below, followed by a preliminary assessment of the potential route-wide effects on these sites.

Table 3.5 Non-statutory designated sites within 2 km of the Study Area of the Project

Non-statutory designated site type	Number of Non-statutory sites within 2 km of the Study Area of the Project
Section 1 New Grimsby West Substation	
LWS	Five (Freshney Parkway LWS, Freshney Parkway North LWS, Laceby Beck North LWS, Laceby Carr Plantation and Pond LWS, and Sweedale Croft Drain LWS).
CWS	None
RNR	None
Section 2 New Grimsby West Substation to Lincolnshire Connection Substation A	
LWS	31 (Brackenborough Road Verge LWS, Brackenborough Wood LWS, Bradley and Dixon Woods LWS, Covenham Reservoir LWS, Disused Railway North of Swinn Wood LWS, Freshney Parkway LWS, Freshney Parkway North LWS, Fulstow Pit LWS, Grange Plantation, Aby LWS, Great Carlton Wetlands LWS, Great Eau LWS, Gloucester House Ponds LWS, Hoppers Holt LWS, Laceby Beck North LWS, Laceby Carr Plantation and Pond LWS, Legbourne Grassland LWS, Long Eau West LWS, Manby Wetlands LWS, Moors Wood, Aby LWS, Mother and Greenfield Woods LWS, Oak Plantation, Woodthorpe LWS, Ratspen Lane Verges LWS, Red Leas Lane Verges LWS, River Freshney Headwaters LWS, Swinn Wood LWS, Swinn Wood Road Verges LWS, The Browse LWS, Tothill Wood LWS, Waithe Beck East LWS, Withern Ings LWS, and Withern Wood LWS).
CWS	None
RNR	3 (Brackenborough RNR, Ratspen Lane RNR and Swinn Wood RNR)
Section 3 New Lincolnshire Connection Substations A and B	
LWS	12 (Disused Railway North of Swinn Wood LWS, Grange Plantation, Aby LWS, Great Eau LWS, Hoppers holt LWS, Moors Wood, Aby LWS, Mother and Greenfield Woods LWS, Oak Plantation, Woodthorpe LWS,

Non-statutory designated site type	Number of Non-statutory sites within 2 km of the Study Area of the Project
	Rigsby Wood LWS, Swinn wood LWS, Swinn Wood Road Verges LWS, The Browse LWS, and Withern wood LWS).
CWS	None
RNR	1 (Swinn Wood RNR)
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone	
LWS	32 (A16 Verges North of the River Glen LWS, Bell Mere Pool LWS, Blue Gowt Drain North LWS, Dog Whipping Ground LWS, Farlesthorpe Pit LWS, Frith Bank Drain LWS, Heath's Meadows LWS, Hobhole Drain, Boston Corporation Farm to Station Cottages LWS, Hobhole Drain, Simmon House Bridge to Benington Bridge LWS, Mackay's Pit LWS, Middlemarsh Farm LWS, Middlemarsh Meadows LWS, Mill Hill Farm Fields LWS, Old Brickyard Plantation, Well LWS, Sloothby Low Lane LWS, Sloothby Meadows LWS, Spendluffe Meadow LWS, South Bank Fosdyke LWS, South Forty Foot Drain LWS, Summergate Meadow LWS, Surfleet End LWS, Surfleet Seas End Saltmarsh LWS, Risegate Eau LWS, River Glen Corridor LWS, The Hollies Field LWS, The Lymn LWS, Well Vale Estate, Belt Plantation LWS, Westgate Wood and Meadow LWS, Willoughby Branch Line LWS, Willoughby Meadow West LWS, Witham Way, Anton's Gowt to Boston LWS, and Vernatts Drain LWS).
CWS	None
RNR	None
Section 5 Refined Weston Marsh Substation Siting Zone	
LWS	15 (A16 East Verge North of the River Glen LWS, A16 East Verge South of the River Glen LWS, Blue Gowt Drain, North LWS, Blue Gowt Drain, Coronation Channel LWS, West Marsh Road LWS, Risegate Eau LWS, River Welland in Spalding LWS, Surfleet Bank LWS, Moulton Park and River LWS, Moulton River LWS, Pinchbeck Marsh LWS, South Bank Fosdyke LWS, Surfleet Seas End Saltmarsh LWS, Vernatt's Drain LWS, and River Glen Corridor LWS).
CWS	None
RNR	None
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation	
LWS	11 (Arnold’s Meadow LWS, Blue Gowt Drain, West Marsh Road LWS, Coronation Channel LWS, Guy Wells Pit LWS, Little South Holland Drain LWS, Moulton Park and River LWS, Pinchbeck Marsh LWS, River Welland Spalding LWS, Slys Connection LWS, Tydd Gote Bank LWS, and Vernatts Drain LWS).

Non-statutory designated site type	Number of Non-statutory sites within 2 km of the Study Area of the Project
CWS	Four (Honnington House Farm CWS, Leverington Gull CWS, North Level Main Drain at Tydd Gate CWS, and River Nene CWS)
RNR	None
Section 7 New Walpole B Substation	
LWS	None
CWS	Four (North Level Main Drain at Tydd Gote CWS, River Nene CWS, The White House CWS, and Honnington House Farm CWS).
RNR	None

3.2.6 A total of 23 LWS and CWS are reported to be located 'close to' (i.e. within 0.1 km) or within the draft Order Limits and Refined Siting Zone in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity**. This includes watercourses which are crossed by the proposed alignment and woodlands that lie adjacent. Due to the proximity of the Project to these LWS/CWS, there is a risk of adverse route-wide effects on habitats (habitat loss and/or degradation) as well as potentially any fauna (e.g. bats, otter and water vole) associated with these LWS/CWS during construction of the Project. It is however noted that indirect impacts associated with the release or mobilisation of pollutants during construction are not likely to result in significant effects upon these sites, given the embedded control measures set out within the draft Outline CoCP (GG06, GG07, GG15, GG16 and W01-W11). Survey work will establish the nature and importance of any receptors associated with these LWS/CWS that may be affected by the works. Therefore, on a precautionary basis, significant route-wide effects on these 24 sites during the construction phase cannot be excluded at this stage of the assessment. No significant route-wide effects are predicted for these sites during the operational and maintenance phase due to the anticipated adherence with National Grid operational procedures relevant to protection of the water environment.

3.2.7 A total of 64 LWS/CWS/RNR report no pathways of effects during the construction or operational and maintenance phases of the Project in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity**, therefore no route-wide effects are anticipated. This is due to the distances between these sites and the draft Order Limits and Refined Siting Zone, as well as the lack of ecological or hydrological connectivity.

3.2.8 Where significant adverse effects on local nature conservation sites are expected, additional mitigation measures, that will be finalised and detailed within the ES once all required baseline surveys are complete, will be implemented.

Habitats

3.2.9 The Project will result in the loss and/or severance of areas of a range of habitats, including HPIs (as identified under Section 41 of the Natural Environment and Rural Communities Act, 2006) (Ref 2) Preliminary impacts and likely significant effects on habitats are reported in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4**

Ecology and Biodiversity, and the Sections in which such habitats are identified is detailed in **Table 3.6** below.

Table 3.6 Habitats of local or above importance identified within the Survey Areas of the Project

Habitat	Importance of habitat	Habitat present in Survey Area of the Project						
		Section 1	Section 2	Section 3	Section 4	Section 5	Section 6	Section 7
Broadleaved and Mixed Woodland	Local and County	Y	Y	Y	Y	Y	Y	
Native Hedgerow	Local	Y	Y	Y	Y	Y	Y	Y
Dense Scrub	Local	Y			Y	Y	Y	
Arable Field Margins	Local				Y	Y	Y	
Rivers and Streams	Local, County and National		Y	Y	Y	Y	Y	
Coastal and Floodplain Grazing Marsh	County		Y		Y	Y	Y	

Broadleaved and mixed woodland

3.2.10 The field surveys completed to date identified woodland within Sections 1, 2, 3, 4, 5 and 6.

3.2.11 There is potential for direct loss of woodland habitat during the construction phase of the Project. There is also potential for damage to trees from use of machinery, compaction of soil or damage to roots, dust emissions, noise and vibration disturbance and artificial illumination from lighting due to the proximity of construction activities.

3.2.12 Measures to minimise harm to woodland are detailed within the CoCP and include GG09 (protective areas) and LV02 (protection of trees in relation to design, demolition and construction).

3.2.13 In some areas woodland habitat will be lost. Survey work will continue through to 2025 to confirm the condition of woodland habitats, in order to inform the design of appropriate mitigation and compensation. The assessment of impacts along with any mitigation, enhancement or compensation proposed, will be developed fully in the ES.

3.2.14 In the absence of supplementary survey findings and confirmed additional mitigation and compensation measures, significant route-wide effects upon woodland habitat during construction cannot be ruled out at this preliminary stage of assessment.

3.2.15 Any new habitats created will be monitored to make sure they achieve their target condition and any residual effects will be reported within the ES. During the operation and maintenance of the Project, National Grid operatives will be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).

Native hedgerows

3.2.16 The field surveys completed to date identified hedgerows within all Sections of the Project. Temporary severance of hedgerows will occur during construction, where the haul road route and access routes are proposed. Wherever possible, habitats will be reinstated post construction (CoCP measure LV01). Existing tracks and roads will be utilised where possible however these may require widening.

3.2.17 Survey work will continue through to 2025 to confirm the condition of hedgerow habitats and to identify any ‘important’ hedgerows under the Hedgerow Regulations 1997. The assessment of impacts along with any mitigation, enhancement or compensation proposed, will be developed fully in the ES. Significant route-wide effects upon hedgerows during construction cannot be ruled out at this preliminary stage of assessment.

3.2.18 Any new hedgerows created will be monitored to make sure they achieve their target condition. During the operation and maintenance of the Project, National Grid operatives will be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes). Any residual effects upon hedgerows after any additional mitigation is applied will be reported within the ES.

Dense scrub

3.2.19 The field surveys completed to date identified scrub within Sections 1, 4, 5 and 6 of the Project. There is potential for direct loss of direct loss of scrub habitat during the construction phase of the Project. There is also potential for damage to scrub from use of machinery, compaction of soil or damage to roots. Measures to minimise harm to habitats are detailed within the CoCP and include GG09 (protective areas), LV01 (vegetation to be retained where practical), and LV02 (protection of trees in relation to design, demolition and construction).

3.2.20 Survey work will continue through to 2025 to confirm the condition of scrub habitat and to inform any necessary mitigation or compensation. Significant route-wide effects upon scrub habitat during construction cannot be ruled out at this preliminary stage of assessment.

3.2.21 No significant impacts on scrub habitat are predicted during operation. Any new habitats created will be monitored to make sure they achieve their target condition and any residual effects will be reported within the ES. During the operation and maintenance of the Project, National Grid operatives will be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).

Arable field margins

3.2.22 The field surveys completed to date identified arable field margins within Sections 4, 5 and 6 of the Project. Temporary loss of field margins may occur during construction, where the haul road route and access routes are proposed. Permanent losses may occur where new substations are proposed. Wherever possible, habitats will be reinstated post construction (CoCP measure LV01). Existing tracks and roads will be utilised where possible however these may require widening.

3.2.23 Survey work will continue through to 2025 to confirm the condition arable field margins and to inform any necessary mitigation. The assessment of impacts along with any mitigation, enhancement or compensation proposed, will be developed fully in the ES. Significant route-wide effects upon arable field margins during construction cannot be ruled out at this preliminary stage of assessment.

3.2.24 No significant impacts on arable field margins are predicted during operation. During the operation and maintenance of the Project, National Grid operatives will be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).

Rivers and streams

3.2.25 The field surveys completed to date identified rivers and streams within Sections 2, 3, 4, 5 and 6. No main rivers were identified within Section 1 or 7. There are five chalk streams within the Survey Areas which are a HPI.

3.2.26 Potential direct impacts upon rivers and streams are possible where overhead lines cross watercourses. However, impacts will be minimised through the setting back of pylons from the channel and marginal habitats. The stringing of the overhead line could potentially result in temporary loss or damage to watercourses however the

stringing methodology will seek to minimise any potential direct impacts to watercourses during construction and any impacts are likely to be temporary.

3.2.27 The construction of temporary access crossings could result in direct impacts upon watercourses. The design of these elements will seek to minimise impacts through reducing the footprint of these works as far as practicable. With best practice construction methods and reinstatement of these habitats post construction, these effects are likely to be temporary (CoCP measures W01 to W11).

3.2.28 Indirect impacts upon aquatic habitats could result from disturbance such as noise and vibration during construction, however, impacts are likely to be short-term. Drainage installations for any sustainable urban drainage systems (SuDS) features have the potential to adversely affect the river system, both directly and indirectly, if not designed appropriately. Further assessment of potential indirect impacts due to construction activities, including changes in water quality, will be undertaken and reported within the ES. Significant route-wide effects upon rivers and streams during construction therefore cannot be ruled out at this preliminary stage of assessment.

3.2.29 National Grid operational procedures relevant to protection of land and habitats will be followed during operation and maintenance and no significant route-wide effects are therefore predicted.

Coastal and floodplain grazing marsh

3.2.30 The field surveys completed to date identified coastal and floodplain grazing marsh within Sections 2, 4, 5 and 6.

3.2.31 Grazing marsh is defined as periodically inundated pasture or meadow, typically with ditches or rills containing standing brackish or fresh water. There is potential for direct habitat loss if infrastructure is located within this habitat. Ground works and/or in-channel works could result in changes in hydrology which may alter the habitat. Indirect impacts upon habitats due to the release or mobilisation of contaminants causing water pollution are not likely to result in significant effects upon HPI, given the embedded control measures set out within the Preliminary CoCP (GG06, GG07, GG15, GG16, W01, W02, W03, W04, W05, W06, W09, W10, W11). Further assessment of potential indirect impacts due to construction activities, including changes in air quality, will be undertaken and reported within the ES. As such, significant route-wide effects on coastal and floodplain grazing marsh cannot be ruled out at this preliminary stage of assessment.

Protected and Notable Species

3.2.32 As detailed within **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity,** there is potential for protected and notable species to be impacted by the Project through habitat loss or degradation, fragmentation or severance of habitat corridors, disturbance (e.g. due to noise or light pollution and increased human presence on-site) or killing/injury through the use of machinery and increased traffic on-site.

3.2.33 Potential impacts upon protected and notable species across the Project are reported upon in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity** and a preliminary assessment of the potential route-wide effects upon such species is provided below.

Terrestrial invertebrates

3.2.34 All habitats within the Study Areas for the Project will support a wide variety of invertebrate species; however, as the majority of habitats are arable and are managed for crop production, they are unlikely to support a significant assemblage of terrestrial invertebrates. Other habitats within the Study Areas such as floodplain grazing marsh, hedgerows and woodland habitats provide suitability for a more diverse assemblage of terrestrial invertebrates.

Construction

3.2.35 Potential impacts on invertebrates through construction activities include temporary losses of habitat or incidental mortality of invertebrate species. It is considered unlikely that areas of temporary habitat loss would have a significant route-wide effect upon the invertebrate assemblage. Relevant measures to reduce potential impacts are detailed within the CoCP and include GG06 (implementation of Management Plans), GG08 (reinstatement of hedgerows), GG09 (establishment of protective area), B08 (maintenance of hedgerow connectivity).

Operation and maintenance

3.2.36 Areas of permanent habitat loss through operation of the Project include the proposed substations and the footprints of pylons. Areas of habitat which will be permanently lost will be appraised to assess their potential to support protected or notable invertebrate assemblages. Following on from this, targeted surveys would be undertaken if required, to inform the final assessments reported in the ES, and any specific mitigation requirements. As the substations will be located within predominantly arable habitat, significant effects on invertebrates are unlikely, however based upon a precautionary approach (due to ongoing baseline surveys), significant route-wide effects on invertebrates cannot be excluded at this stage in the assessment.

Great crested newt

3.2.37 Survey results to date confirm that GCN are present within the Survey Areas for Sections 2, 3, 4 and 6 of the Project.

Construction

3.2.38 Potential route-wide impacts on GCN through construction activities include a risk of direct mortality and/or injury of GCN as a result of habitat clearance and construction activities within 250 m of a waterbody with confirmed GCN presence. Temporary (short-term) and permanent loss and/or damage to supporting terrestrial habitats within 250 m of a confirmed GCN water body could occur, for example as a result of ground works and vegetation clearance, and temporary removal of connective features, such as hedgerows to facilitate construction. There could be a temporary short-term reduction in foraging and sheltering opportunities and temporary severance of commuting habitats.

3.2.39 Where impacts upon great crested newt cannot be avoided, a licence from Natural England will be required to permit derogation (as outlined in management measure B01). Indicative locations for mitigation are provided on **PEI Report Volume 2 Part B Section 2 Figure 1.3 Permanent and Operation Features**.

3.2.40 Additional relevant management measures to reduce potential impacts during construction include pollution control measures (GG15, GG16, GG17), implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08) and directional and minimised lighting (LV04).

3.2.41 Seasonal survey work will continue in 2025 to confirm the presence/likely absence of great crested newt, and the survey results will be used to inform the assessment and any appropriate mitigation to be reported within the ES. Therefore, on a precautionary basis, significant route-wide effects on great crested newt during the construction phase cannot be excluded at this stage of the assessment.

Operation and maintenance

3.2.42 Maintenance activities will be completed in accordance with the Applicant's operational policies and therefore no significant route-wide effects on GCN are predicted during operation and maintenance.

Reptiles

3.2.43 All Sections of the Project have some habitats with suitability to support common reptile species (i.e. grass snake, slow worm and common lizard). Suitable habitat is generally limited in extent, being confined to field boundaries the margins of ditches, hedgerows and woodland/scrub.

Construction

3.2.44 There is potential for impacts on reptiles through construction activities causing habitat loss and risk of death or injury during construction.

3.2.45 Where impacts upon reptiles cannot be avoided, measures will be implemented to prevent a breach of legislation. These measures are outlined in B05 are likely to include two stage habitat manipulation of suitable habitats with an Ecological Clerk of Works (ECoW) appointed to oversee works. Any species translocation (if required) will be undertaken in accordance with a strict method statement B09.

3.2.46 In addition, relevant measures to reduce potential impacts include implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08).

3.2.47 Seasonal survey work will continue in 2025 to confirm the status of reptiles. The survey results will be used to inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.

3.2.48 On a precautionary basis, significant route-wide effects on reptiles during the construction phase cannot be excluded at this stage of the assessment.

Operation and maintenance

3.2.49 Maintenance activities will be completed in accordance with the Applicant's operational policies and therefore no significant route-wide effects on reptiles are predicted during operation and maintenance.

Birds: wintering and breeding

3.2.50 All Sections within the Project support an assemblage of breeding and non-breeding birds.

Construction

3.2.51 There is potential for impacts on breeding and wintering birds through construction activities causing loss of habitat and disturbance to birds through noise, construction traffic movements and increased human presence on-site. Construction of the Project would result in the temporary loss of arable, hedgerow and grassland habitat that is utilise by birds for foraging, roosting and resting, within the entirety of the Order Limits. If site clearance and construction activities should occur during the breeding season (typically March to August for most species) this could result in the destruction of and/or damage to nests.

3.2.52 Measures to reduce potential impacts on birds during construction include the implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08) and lighting restrictions (LV04). Habitat loss and disturbance will not take place within all Sections of the Project simultaneously, however as a construction programme is not yet available, potential route-wide effects on birds as a result of habitat loss, disturbance and displacement cannot be excluded at this stage.

3.2.53 It should be noted that bird surveys are incomplete, and survey work will continue over the winter of 2024/2025 and the spring/summer of 2025 to confirm the status of wintering and breeding birds respectively, and to inform the assessment of impacts and effects and the design of appropriate mitigation and enhancement, which will be further developed and presented within the ES. On a precautionary basis, significant route-wide effects on wintering and breeding birds during construction cannot be excluded at this stage of the assessment.

Operation and maintenance

3.2.54 Potential impacts on birds during operation include direct habitat loss where permanent infrastructure is proposed, barrier effects and mortality as a result of collision with overhead lines.

3.2.55 Mitigation to reduce the scale of potential impacts on breeding and non-breeding birds may include the creation of new habitat to mitigate or compensate any potential habitat loss or displacement.

3.2.56 The collision risk with the overhead lines associated with the Project during operation will be fully assessed once further winter and breeding bird data have been collected. Therefore, on a precautionary basis, significant route-wide effects upon breeding and non-breeding birds during operation cannot be excluded at this stage of the assessment.

Bats

3.2.57 All Sections within the Project include habitats which have suitability for roosting, foraging and commuting bats. The bat activity surveys conducted to date have identified that the following species are present: common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), noctule (*Nyctalus noctula*), brown long-eared (*Plecotus*

auritus), Daubenton's (*Myotis daubentonii*), barbastelle (*Barbastella barbastellus*), Leisler's bat (*Nyctalus leisleri*) and *Myotis* genus bats.

Construction

3.2.58 There is potential for both permanent and temporary loss of roosting, foraging and commuting habitat for bats and severance of commuting routes, and there is likely to be impacts from disturbance such as noise, vibration and lighting during construction. Specifically, hedgerow and areas of woodland habitats will require clearance during construction to allow establishment of on-site accesses and within the footprint of proposed pylons and substations.

3.2.59 As outlined in B13, in the first instance reasonable avoidance measures will be incorporated to avoid impacting known bat roosts. Where impacts upon bats roosts cannot be avoided, a licence from Natural England will be required to permit derogation (as outlined in CoCP management measure B01). Additional relevant management measures to reduce potential impacts include the implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08) and lighting restrictions to (LV04).

3.2.60 The survey work in 2024 and 2025 will be used to confirm the assemblage of foraging and commuting bats within the Survey Area and to identify any important foraging or commuting routes. The surveys will also identify any bat roosts which could be impacted by the Project. The outputs of these surveys will be used to confirm the status of bats and the assessment reported within the ES. As such, significant route-wide effects on bats during construction cannot be excluded at this stage in the assessment.

Operation and maintenance

3.2.61 Future maintenance work during operation of the Project may require works that interact with possible bat roosts, for example if any tree felling is required, and therefore appropriate management and mitigation will be required. National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly. As such, there will be no significant route-wide effects on bat roosts during operation and maintenance.

3.2.62 During operation, lighting would be required at the substation sites to allow for safe movement and the operation of equipment. Security lighting would also be required. All lighting would be designed in accordance with the appropriate design standards and National Grid technical specifications. Security lighting would be event activated (i.e. would not be continuous) and would be designed to be environmentally sensitive (e.g. directional and low light not exceeding 50 lux).

3.2.63 With the aforementioned controls, there will be no significant route-wide effects on bats during operation.

Otter

3.2.64 The field surveys to date have identified potential otter resting places (i.e. holts, couches) within the Survey Areas for Section 4 and otter field signs (i.e. spraints, footprints) within the Survey Areas for Sections 2 and 6 of the Project. All Sections of

the Project have some suitability for otter and otter may use the watercourses and ditches/field drains for foraging and commuting.

Construction

3.2.65 Where otter are present, there is the potential for disturbance through noise, vibration, increased human presence and site lighting during construction. Habitat degradation could potentially occur through pollution of habitats. There is also a risk of machinery and traffic killing or injuring otters if they are present during construction activities.

3.2.66 As outlined in B13, in the first instance reasonable avoidance measures will be incorporated to avoid impacting known otter holts or resting places. As outlined under CoCP measure B01, if it is not possible to avoid impacts on otter holts, a licence from Natural England will be sought to permit derogation. Additional relevant management measures to reduce potential impacts include pollution control measures (GG15, GG16, GG17), implementation of Management Plans (GG06), establishment of protective areas (GG09), lighting restrictions (LV04) and closing of excavations overnight to avoid entrapment (B03).

3.2.67 In addition, as outlined in B12 a method statement will be required to ensure works within watercourse crossings include suitable measures to allow the passage of otters.

3.2.68 The survey work in 2024 and 2025 will be used to confirm presence/absence of otter resting places within the Survey Area and to inform any requirements for mitigation or licensing. As such, significant route-wide effects on otter during construction cannot be excluded at this stage in the assessment.

Operation and maintenance

3.2.69 During operation, lighting would be required at the substation sites to allow for safe movement and the operation of equipment. Security lighting would also be required. All lighting would be designed in accordance with the appropriate design standards and National Grid technical specifications. Security lighting would be event activated (i.e. would not be continuous) and would be designed to be environmentally sensitive (e.g. directional and low light not exceeding 50 lux).

3.2.70 National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly. Therefore, there will be no significant route-wide effects on otter during operation and maintenance.

Water vole

3.2.71 Survey results to date suggest that water voles are present within the Survey Areas for Sections 2, 4, 5, 6 and 7 of the Project. All Sections of the Project have some suitability for water vole, but the majority of ditches in Sections 1 and 5 were found to be largely unsuitable for water vole due to being dry at the time of survey.

Construction

3.2.72 There is potential for impacts on water voles through construction activities causing damage to watercourses and associated riparian habitat and potential incidental mortality during construction of the Project. Furthermore, there may be suitable

habitats within and/or adjacent to the draft Order Limits and Refined Siting Zone that could be impacted by proposed works (e.g. through habitat loss, disturbance and fragmentation).

3.2.73 If impacts to water vole burrows cannot be avoided, a licence from Natural England will be sought to permit derogation (as outlined in CoCP measure B01). Additional relevant management measures set out in the CoCP to reduce potential impacts include pollution control measures (GG15, GG16, GG17 and W01 to W11), implementation of Management Plans (GG06), establishment of protective areas (GG09) and lighting restrictions (LV04).

3.2.74 In addition, as outlined in B12 a method statement will be required to ensure works within watercourse crossings include suitable measures to allow the passage of water vole.

3.2.75 The outputs of further survey work to be conducted in 2025 will be used to confirm the status of water voles across the Project Survey Area and will inform the design of appropriate mitigation and assessment of effects on water voles reported within the ES.

3.2.76 Therefore, on a precautionary basis, significant route-wide effects on water voles cannot be excluded during the construction phase at this stage of the assessment.

Operation and maintenance

3.2.77 During operation, lighting would be required at the substation sites to allow for safe movement and the operation of equipment. Security lighting would also be required. All lighting would be designed in accordance with the appropriate design standards and National Grid technical specifications. Security lighting would be event activated (i.e. would not be continuous) and would be designed to be environmentally sensitive (e.g. directional and low light not exceeding 50 lux).

3.2.78 National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly. Therefore, there will be no significant route-wide effects on water vole during operation and maintenance.

Badger

3.2.79 Survey results to date suggest that badgers are present within the Survey Areas for Sections 1, 2, 3, 4, 5 and 6 of the Project, however, all Sections of the Project are suitable to support badger (including setts).

Construction

3.2.80 As detailed in **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity**, there is potential for impacts on badgers through habitat loss (i.e. the loss of setts) and through general disturbance impacts during construction such as from noise and vibration, temporary site lighting, human presence and potentially an increased risk of vehicle-animal collisions.

3.2.81 As outlined in B13, in the first instance the reasonable avoidance measures will be incorporated to avoid impacting known badger setts. As outlined in B01, if direct impacts on badger setts cannot be avoided, a licence from Natural England will be sought to permit derogation from legislation. Mitigation measures may include the

provision of artificial setts within the draft Order Limits and Refined Siting Zone where main setts will be closed.

3.2.82 Additional relevant management measures to reduce potential impacts include the implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08), lighting restrictions (GG21) and closing of excavations overnight to avoid entrapment (B03).

3.2.83 The outputs of further survey work to be conducted in 2025 will be used to confirm the status of badgers across the Project Survey Area and will be used to inform the assessment of impacts and effects and any appropriate mitigation and enhancement measures, which will be developed fully and presented within the ES. Therefore, on a precautionary basis, significant route-wide effects on badger during the construction phase cannot be excluded at this stage of the assessment.

Operation and maintenance

3.2.84 During operation, lighting would be required at the substation sites to allow for safe movement and the operation of equipment. Security lighting would also be required. All lighting would be designed in accordance with the appropriate design standards and National Grid technical specifications. Security lighting would be event activated (i.e. would not be continuous) and would be designed to be environmentally sensitive (e.g. directional and low light not exceeding 50 lux).

3.2.85 National Grid or their appointed Contractor will be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time will be identified and mitigated accordingly. Therefore, there will be no significant route-wide effects on badgers during operation and maintenance.

Fish

3.2.86 The desk study results to date have identified notable fish species are present within the Survey Area for Sections 1, 2, 3, 4, 5 and 6 of the Project. However, due to lack of Main Rivers and generally dry and uniform habitats within the Section 1 and Section 7 Study Area the species present within these Sections are unlikely to be protected/notable.

Construction

3.2.87 There is a risk that habitats supporting protected and notable fish species will be impacted during construction by transmission line infrastructure, supporting structures and associated access tracks. There is also the potential for short-term impacts on habitat connectivity, fragmentation, degradation and disturbance, as well as the risk of incidental mortality of protected fish species during construction works.

3.2.88 As outlined in CoCP measure B10, where any in channel watercourse works are required, works will be completed outside of fish spawning season (March 16th-June 16th inclusive) and fish migratory seasons (species specific, dependant on the waterbody) (CoCP measure B10). As outlined under CoCP measure B01, where impacts upon notable fish species cannot be avoided, appropriate permits may be required, such as an FR2 licence from the Environment Agency.

3.2.89 Additional relevant management measures set out in the CoCP to reduce potential impacts include pollution control measures (GG15, GG16, GG17 and W01 to W11),

implementation of Management Plans (GG06), establishment of protective areas (GG09), lighting restrictions (LV04).

3.2.90 In addition, as outlined in B12, a method statement will be required to ensure works within watercourse crossings include suitable measures to allow the passage of fish. Measure B10 states that where any in channel watercourse works are required, works will be completed outside of fish spawning season (16 March to 16 June inclusive) and fish migratory seasons (species specific, dependant on the waterbody) subject to likely fish presence confirmed through pre-construction fish surveys.

3.2.91 The outputs of further survey work to be conducted in 2025 will be used to confirm the status of fish across the Project Survey Area and will inform the design of appropriate mitigation and assessment of effects on fish reported within the ES.

3.2.92 Therefore, on a precautionary basis, significant route-wide effects on fish cannot be excluded during the construction phase at this stage of the assessment.

Operation and maintenance

3.2.93 During operation, lighting would be required at the substation sites to allow for safe movement and the operation of equipment. Security lighting would also be required. All lighting would be designed in accordance with the appropriate design standards and National Grid technical specifications. Security lighting would be event activated (i.e. would not be continuous) and would be designed to be environmentally sensitive (e.g. directional and low light not exceeding 50 lux).

3.2.94 The outputs of further survey work to be conducted in 2025 will be used to confirm the status of species of fish present and inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.

3.2.95 Therefore, on a precautionary basis, significant effects on fish within Sections 2, 3, 4, 5 and 6 cannot be excluded at this stage of the assessment but no significant effects are anticipated for Sections 1 and 7.

3.2.96 Maintenance activities will be completed in accordance with the Applicant's best practice requirements which include:

i. Minimising pollution risks as far as practicable through the control of hazardous substances, including refuelling of plant and equipment away from drains or watercourses within dedicated areas and the use of secondary containment systems, such as bunds, drip trays and plant nappies; and

ii. Consultation with the relevant regulatory body where works are required in, around, or that may impact watercourses, or there is a potential impact on local flora and fauna of works near controlled waters.

3.2.97 Therefore, no route-wide significant effects on fish are predicted during operation.

Aquatic macroinvertebrates and macrophytes

3.2.98 The desk study results to date have identified protected and notable aquatic macroinvertebrates and aquatic macrophytes are present within the Study Areas for Sections 2, 3, 4 and 6 of the Project. Due to lack of Main Rivers and generally dry and uniform habitats within the Section 1 and Section 7 Study Area the species present within these Sections are unlikely to be protected/notable.

Construction

3.2.99 There is a risk of construction works impacting watercourses and associated aquatic macrophytes and macroinvertebrates causing incidental mortality of protected species. Furthermore, there may be suitable habitats within and/or adjacent to the draft Order Limits that could be impacted by proposed works (e.g., through habitat loss, disturbance and fragmentation). There is also potential for the disturbance of macroinvertebrates.

3.2.100 Relevant management measures set out in the CoCP to reduce potential impacts to aquatic macroinvertebrates and aquatic macrophytes include pollution control measures (GG15, GG16, GG17 and W1 to W11), implementation of Management Plans (GG06), establishment of protective areas (GG09) and lighting restrictions (LV04).

3.2.101 The outputs of further survey work to be conducted in 2025 will be used to confirm the status of these taxons and will inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES. For aquatic macroinvertebrates, survey site selection has been based on crossing point locations where culverts, bridges and/or outfalls have the potential to influence macroinvertebrate populations.

3.2.102 On a precautionary basis, significant effects on aquatic macroinvertebrates and macrophytes in Sections 2, 3, 4, 5 and 6 during construction cannot be excluded at this stage of the assessment but no significant effects for Sections 1 and 7 are anticipated.

3.2.103 Therefore, on a precautionary basis, significant route-wide effects on notable aquatic macroinvertebrates and aquatic macrophytes cannot be excluded during the construction phase at this stage of the assessment.

Operation and maintenance

3.2.104 Maintenance activities will be completed in accordance with the Applicant's best practice requirements which include:

i. Minimising pollution risks as far as practicable through the control of hazardous substances, including refuelling of plant and equipment away from drains or watercourses within dedicated areas and the use of secondary containment systems, such as bunds, drip trays and plant nappies; and

ii. Consultation with the relevant regulatory body where works are required in, around, or that may impact watercourses, or there is a potential impact on local flora and fauna of works near controlled waters.

3.2.105 Therefore no route-wide significant effects on aquatic macroinvertebrates or aquatic macrophytes are predicted during operation.

Other notable species

3.2.106 The desk study results to date have identified other notable species within the Section Study Areas of the Project such as hedgehog (all Sections), brown hare (2, 3, 4, 5, 6 and 7), harvest mouse (Sections 4 and 6), common toad (Sections 4 and 5) and polecat (Section 5).

Construction

3.2.107 There is potential for impacts on other notable species through habitat loss, incidental harm or mortality during construction of the Project.

3.2.108 The following control measures detailed within the CoCP will prevent harm to hedgehog, harvest mouse and brown hare during construction: G06, B01, B03.

3.2.109 Further habitat and species surveys planned, will include the incidental recording of other notable species. The results of these further surveys will be presented in the ES.

3.2.110 Significant route-wide impacts are not anticipated for other notable species during the construction phase.

Operation and maintenance

3.2.111 Maintenance activities will be completed in accordance with the Applicant's best practice policies and therefore no significant route-wide effects upon other notable species are predicted.

Invasive Non-native Species

3.2.112 The presence of INNS has been identified within the Study Areas for all Sections of the Project.

Construction

3.2.113 There is potential for the spread of INNS during construction activities.

3.2.114 The relevant management measure set out in the CoCP to reduce the spread of INNS is B04 which will ensure that the construction works do not result in the spreading or mishandling of any INNS.

3.2.115 Further habitat and species surveys planned, will include the incidental recording of other notable species. The results of these further surveys will be presented in the ES.

3.2.116 The spread of INNS during construction activities is therefore not anticipated to be significant at a route-wide level.

Operation and maintenance

3.2.117 There is potential for the spread of INNS during maintenance activities.

3.2.118 Adherence with National Grid best practice procedures which include identifying and notifying the presence of invasive species within the operational areas of the site, will ensure that any maintenance works do not result on the spreading or mishandling of any INNS.

3.2.119 The spread of INNS during operation and maintenance is therefore not anticipated to be significant at a route-wide level.

References

Ref 1 UKHab (2018.2022). The UK Habitat Classification System [online]. Available at: https://ukhab.org/ [Accessed 01 March 2024].

Ref 2 H.M. Government (2006). Natural Environment and Rural Communities Act 2006. HMSO, London [online]. Available at: https://www.legislation.gov.uk/ukpga/2006/16/contents [Accessed 3 June 2024].

4. Historic Environment

nationalgrid

Contents

4. Historic Environment

4.1 Introduction

4.1.1 This chapter presents a summary of the route-wide preliminary impacts and likely significant effects of the Grimsby to Walpole Project (the Project) on the Historic Environment. Impacts and significant effects of the Project on the Historic Environment at a Section-level are reported in **PEI Report Volume 2 Part B Section 1-7 Chapter 5 Historic Environment.**

4.1.2 This chapter specifically provides a summary of the preliminary impacts and likely significant effects on the following designated heritage assets:

i. Scheduled monuments;

ii. Grade I, II*, II listed buildings or structures;

iii. Conservation areas; and

iv. Registered parks and gardens.

4.1.3 Potential impacts of the Project on non-designated heritage assets are reported at a Section-level within **PEI Report Volume 2 Part B Section 1-7 Chapter 5 Historic Environment** and are not considered to require a route-wide assessment. Any likely significant effects upon non-designated heritage assets, including historic farmsteads, reported within each Section is also recorded within the **PEI Report Volume 2 Part B Sections 1-7 Chapter 13 Summary.**

4.2 Route-Wide Summary of Effects

4.2.1 Designated heritage assets can be affected through either physical impact (to their historic fabric) or alteration/change to their setting (as a result of construction activities and/or the introduction of the physical form and appearance of built infrastructure into the landscape).

4.2.2 As detailed in **PEI Report Volume 3 Part A Appendix 4B EIA Assessment Methodologies and Scope**, the assessment for Historic Environment in this PEI Report utilises the following Study Area, comprising the area directly affected by the Project and a buffer around the draft Order Limits and Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone):

i. 3 km from the draft Order Limits and Refined Siting Zone for all designated heritage assets;

ii. 3 - 5 km from the draft Order Limits and Refined Siting Zone for designated heritage assets of high value; and

iii. beyond 5 km from the draft Order Limits and Refined Siting Zone for high value designated heritage assets whereby their setting has the potential to be impacted by the Project.

4.2.3 Control Mitigation Measures implemented to reduce anticipated impacts on the Historic Environment are set out in the Preliminary Code of Construction Practice (CoCP) provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP.**

4.2.4 Where it is not possible to implement embedded mitigation, or to avoid impacts to earthwork remains or buried archaeological deposits that are present within designated heritage assets, additional mitigation measures may be required to reduce or offset impacts and to manage the Historic Environment. Potential additional mitigation measures which may be required to reduce the effects of the Project upon Historic Environment remain under consideration at this preliminary stage of assessment.

4.2.5 The requirements for, and scope of, archaeological control measures and additional mitigation will be set out in an Overarching Written Scheme of Investigation (OWSI) and a Construction Environmental Management Plan (CEMP), to be submitted with the Development Consent Order (DCO) application, setting out how the requirements for archaeological control measures at each stage of construction will be implemented.

Scheduled Monuments

4.2.6 Across the route of the Project, there are 89 Scheduled Monuments within the Study Areas.

4.2.7 Of these 89 Scheduled Monuments, as reported within **PEI Report Volume 2 Part B Section 1-7 Chapter 5 Historic Environment**, likely significant effects are reported on the following assets (detailed within **Table 4.1**). For the Scheduled Monuments within the Section 5 Study Area, it has not been possible to assess the magnitude of the potential impacts or categorise the resulting significance of effects at this current PEI Report stage, though it has been reported in **PEI Report Part B Section 5 Chapter 5 Historic Environment** where significant effects are likely. A full impact assessment will be presented in the Historic Environment chapter of the Environmental Statement (ES).

Table 4.1 Likely significant effects of the Project upon Scheduled Monuments

Scheduled Monument	Value of asset	Impact	Magnitude of impact	Significance of effect
Section 1 New Grimsby West Substation				
Healing Hall (NHLE 1010947)	High	Temporary impact from construction activities of the Project.	Small	Moderate adverse effect (significant).
Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A				
Moated Site immediately west of Hall Farm (NHLE 1019070)	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
Toot Hill motte and bailey castle (NHLE 1016782)	High	Temporary impact from construction activities of the Project.	Medium	Major adverse effect (significant).
		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Medium	Major adverse effect (significant).
Castle Hill, moated site with Civil War earthworks (NHLE 1019067)	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Castle Hill motte and bailey castle, Castle	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).

Scheduled Monument	Value of asset	Impact	Magnitude of impact	Significance of effect
Carlton (NHLE 1016783)		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Round Barrow Cemetery with outlying barrow to the west of Tetney and north of the Waithe Beck (NHLE 1469975)	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
North Cockerington Hall moated site (NHLE 1004988)	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Section 3 New Lincolnshire Connection Substations A and B				
Site of St Mary's Priory (NHLE 1008687)	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).

Scheduled Monument	Value of asset	Impact	Magnitude of impact	Significance of effect
Markby Priory (NHLE 1004987)	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone				
Butterbump round barrow cemetery (NHLE 1003615)	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Castle Hill: a motte castle 250 m east of Hanby Hall Farm (NHLE 1019173)	High	Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Manwar Ings: remains of a motte and bailey castle (NHLE 1018684)	High	Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Section 5 Refined Weston Marsh Substation Siting Zone				
Wykeham Chapel moated monastic	High and medium	-	-	Likely significant.

Scheduled Monument	Value of asset	Impact	Magnitude of impact	Significance of effect
grange (NHLE 1019096) comprised of chapel (NHLE 1064471) and farmhouse (NHLE 1147513).				
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation				
King's Hall moated site scheduled monument (NHLE 1017217)	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Romano-British settlement south of Shell Bridge (NHLE 1004982)	High	Permanent changes to the setting of the Scheduled Monument arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Section 7 New Walpole B Substation				
No likely significant effects upon Scheduled Monuments.				

4.2.8 As per **Table 4.1** above, no likely significant effects upon scheduled monuments are reported in within **PEI Report Volume 2 Part B Section 7 Chapter 5 Historic Environment**. However, an application to schedule the medieval remains of moated enclosure and great house (MNF2207) was received by Historic England in January 2025, therefore conferring the status and protection of a scheduled monument to the asset for the duration of the application and as such the remains are considered to be of high heritage value.

4.2.9 Construction of the Project may temporarily alter the setting of this asset which would have a medium adverse impact, therefore resulting in a major adverse effect, which would be significant prior to the implementation of additional mitigation measures. Permanent changes to the setting of this asset arising from the presence of the Project (including proposed mitigation planting for screening the proposed new Walpole B Substation), from the time of construction and throughout its operational duration in the wider landscape, would result in major adverse effect which is significant.

4.2.10 Further details of these likely significant effects upon Scheduled Monuments across the route of the Project are provided in **PEI Report Volume 2 Part B Section 1-7 Chapter 5 Historic Environment**.

Listed Buildings or Structures

4.2.11 Across the route of the Project, there are 864 listed buildings and structures within the Study Areas.

4.2.12 Of these 864 listed buildings and structures, as reported within **PEI Report Volume 2 Part B Section 1-7 Chapter 5 Historic Environment**, likely significant effects are reported on the following assets (detailed within **Table 4.2**). For the listed buildings within the Section 5 Study Area, it has not been possible to assess the magnitude of the potential impacts or categorise the resulting significance of effects at this current PEI Report stage, though it has been reported in **PEI Report Part B Section 5 Chapter 5 Historic Environment** where significant effects are likely. A full impact assessment will be presented in the Historic Environment chapter of the ES.

Table 4.2 Likely significant effects of the Project upon listed buildings and structures

Listed building or structure	Value of asset	Impact	Magnitude of impact	Significance of effect
Section 1 New Grimsby West Substation				
No likely significant effects upon listed buildings and structures.				
Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A				
Church of St Martin (NHLE 1359965) grade I listed building	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the grade I listed building arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Manor House (NHLE 1062994) grade II listed building	Medium	Temporary impact from construction of the Project.	Medium	Moderate adverse effect (significant).
		Permanent changes to the setting of the grade II listed building arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Medium	Moderate adverse effect (significant).
Little Laceby Farmhouse (NHLE 1161227) grade II listed building	Medium	Temporary impact from construction of the Project.	Medium	Moderate adverse effect (significant).
Salter Fen Lock (NHLE 1063081) grade II listed buildings (part of the	Medium	Temporary impact from construction of the Project.	Medium	Moderate adverse effect (significant).

Listed building or structure	Value of asset	Impact	Magnitude of impact	Significance of effect
Louth Canal historic waterway (recorded as a non-designated heritage asset Louth Navigation MLI86587))				
Section 3 New Lincolnshire Connection Substations A and B				
Church of St Andrew (NHLE 1308650) grade II* listed building	High	Temporary impact from construction of the Project .	Small	Moderate adverse effect (significant).
		Permanent changes to the setting of the grade II* listed building arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Manor Farmhouse (NHLE 1063012) grade II listed building	Medium	Temporary impact from construction of the Project.	Medium	Moderate adverse effect (significant).
		Permanent changes to the setting of the grade II listed building arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Medium	Moderate adverse effect (significant).
Group of grade II listed buildings: Manor House (NHLE 1308599), Stable Block at Thoresthorpe Manor House (NHLE 1063013) and Barn	Medium	Temporary impact from construction of the Project.	Medium	Moderate adverse effect (significant).
		Permanent changes to the setting of the grade II listed buildings arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Medium	Moderate adverse effect (significant).

Listed building or structure	Value of asset	Impact	Magnitude of impact	Significance of effect
at Thoresthorpe Manor House (NHLE 1308602)				
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone				
Bridge over Twenty Foot Drain (NHLE 1359723) grade II listed structure	Medium	Temporary impact from construction of the Project.	Large	Major adverse effect (significant).
Parish Church of St Botolph, Boston (NHLE 1388844) grade I listed building	High	Permanent changes to the setting of the grade I listed building arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Small	Moderate adverse effect (significant).
Section 5 Refined Weston Marsh Substation Siting Zone				
The Pigeoncote (NHLE 1064477) grade II listed building	Medium	-	-	Likely significant.
Wykeham Chapel of St Nicholas (NHLE 1064471) grade I listed building and the Chapel Farmhouse (NHLE 1147513) associated gate	High and Medium	-	-	Likely significant.

Listed building or structure	Value of asset	Impact	Magnitude of impact	Significance of effect
piers (NHLE 1064472) grade II listed buildings				
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation				
Moulton Windmill (NHLE 1308557) grade I listed structure	High	Temporary impact from construction of the Project.	Small	Moderate adverse effect (significant).
Ingleborough Mill (NHLE 1077675) grade II listed building	Medium	Temporary impact from construction of the Project.	Medium	Moderate adverse effect (significant).
		Permanent changes to the setting of the grade II listed building arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Medium	Moderate adverse effect (significant).
Section 7 New Walpole B Substation				
Faulkner House (NHLE 1237331) grade II listed building	Medium	Temporary impact from construction of the Project.	Medium	Moderate adverse effect (significant).
		Permanent changes to the setting of the grade II listed building arising from the presence of the Project, from the time of construction and throughout its operational duration in the wider landscape.	Medium	Moderate adverse effect (significant).

4.2.13 Further details of these likely significant effects upon listed buildings and structures across the route of the Project are provided in **PEI Report Volume 2 Part B Section 1-7 Chapter 5 Historic Environment.**

Conservation Areas

4.2.14 Across the route of the Project, there are 23 Conservation Areas within the Study Areas. These are:

i. Section 1 New Grimsby West Substation:
   - Great Coates Conservation Area (NHLE 7642); and
   - Wellow Conservation Area (NHLE 7630).

ii. Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A:
   - Cottagers Plot Conservation Area (NHLE 7639);
   - Laceby Conservation Area (NHLE 7638);
   - Scartho Conservation Area (NHLE 7631);
   - Irby upon Humber Conservation Area (NHLE 7629);
   - Waltham Conservation Area (NHLE 7641);
   - North Thoresby Conservation Area (NHLE 4525); and
   - Louth Conservation Area (NHLE 4524).

iii. Section 3 New Lincolnshire Connection Substations A and B:
   - Alford Conservation Area (NHLE 4519).

iv. Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone:
   - Wigtoft Conservation Area (NHLE 7608);
   - Kirton Holme Conservation Area (NHLE 7606);
   - Burgh le Marsh Conservation Area (NHLE 4521);
   - Bicker Conservation Area (NHLE 7600);
   - Kirton Conservation Area (NHLE 7605);
   - Gosberton Conservation Area (NHLE 4861);
   - Wainfleet Conservation Area (NHLE 4533); and
   - Swineshead Conservation Area (NHLE 7607).

v. Section 5 Refined Weston Marsh Substation Siting Zone:
   - Pinchbeck Conservation Area.

vi. Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation:
   - Tydd Gote Conservation Area (NHLE 4867);

- Moulton Conservation Area (NHLE 4863);
- Tydd St. Mary Conservation Area (NHLE 4866); and
- Spalding Conservation Area (NHLE 1920).

vii. Section 7 New Walpole B Substation: no Conservation Areas.

4.2.15 No likely significant effects upon Conservation Areas due to the Project are reported within **PEI Report Volume 2 Part B Section 1-7 Chapter 5 Historic Environment.**

Registered parks and gardens

4.2.16 Across the route of the Project, there are four registered parks and gardens within the Study Areas. These are:

i. Section 1 New Grimsby West Substation:
   - People's Park grade II* registered park and garden (NHLE 1001505).

ii. Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A:
   - No registered park and gardens within the Section 2 Study Areas.

iii. Section 3 New Lincolnshire Connection Substation A and B:
   - No registered park and gardens within the Section 3 Study Areas.

iv. Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone:
   - Well Hall grade II Registered Park and Garden (NHLE 1000992); and
   - Gunby Hall grade II Registered Park and Garden (NHLE 1000979).

v. Section 5 Refined Weston Marsh Substation Siting Zone:
   - No registered park and gardens within the Section 3 Study Areas.

vi. Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation:
   - Ayscoughfee Hall grade II registered park and garden (NHLE 1000969).

vii. Section 7 New Walpole B Substation:
   - No registered park and gardens within the Section 7 Study Areas.

4.2.17 No likely significant effects upon registered parks and gardens due to the Project are reported within **PEI Report Volume 2 Part B Section 1-7 Chapter 5 Historic Environment**.

5. Water Environment and Flood Risk

nationalgrid

Contents

5. Water Environment and Flood Risk

5.1 Introduction

5.1.1 This chapter presents a summary of the route-wide preliminary impacts and likely significant effects of the Grimsby to Walpole Project (the Project) on the Water Environment and Flood Risk. Impacts and significant effects of the Project on the Water Environment and Flood Risk at a Section-level are reported in **Preliminary Environmental Information (PEI) Report Volume 2 Part B Sections 1-7 Chapter 6 Water Environment and Flood Risk.**

5.1.2 A supporting Flood Risk Assessment (FRA) is being developed in accordance with the requirements of the Energy National Policy Statement (NPS) EN-1 and EN-5 (Ref 1), the National Planning Policy Framework (Ref 2), and relevant local planning policy and local flood risk management guidelines published by the Lead Local Flood Authorities (LLFAs) and Internal Drainage Boards (IDBs). The final FRA will be included within the Environmental Statement (ES) submitted with the Development Consent Order (DCO) application. A preliminary FRA at this PEI report stage is provided in **PEI Report Volume 3 Part C Appendix 5A Preliminary Flood Risk Assessment**.

5.1.3 An assessment of compliance with the Water Framework Directive (WFD) will be produced in line with Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Ref 3) within the ES. A summary of the WFD assessment approach and Stage 1 Screening assessment is provided in **PEI Report Volume 3 Part C Appendix 5B Preliminary WFD Assessment**.

5.1.4 This chapter specifically provides a summary of the preliminary impacts and likely significant effects on aquatic environment receptors, through deterioration in water quality and effects on the hydromorphology and flow conveyance. It also considers flood risk on a route-wide level and provides the conclusion of the testing reported within the preliminary FRA.

5.1.5 The conclusions of the preliminary assessment of impacts and likely significant effects on the Water Environment and Flood Risk reported in **PEI Report Volume 2 Part B Sections 1-7 Chapter 6 Water Environment and Flood Risk** has relied upon data and records provided by third parties. No walkover survey inspections or ground investigations have been conducted specifically for the preliminary assessment, although it is anticipated that walkover surveys will be carried out in 2025 to inform the assessment of impacts that will be developed fully and presented within the ES.

5.1.6 Aquatic environment receptors, water resource receptors and flood risk receptors in these three classes are only identified as receptors where they intersect with the Study Area for Water Environment and Flood Risk. Potential impacts upon water resource receptors (including licensed surface water abstractions, unlicensed surface water abstractions for private water supply and discharges to surface waters) are not considered to require a route-wide assessment as they are localised receptors that are located within individual Sections of the Project and are therefore only considered

at a Section-level in the **PEI Report Volume 2 Part B Sections 1-7 Chapter 6 Water Environment and Flood Risk**.

5.2 Route-Wide Summary of Effects

Aquatic Environment Receptors

5.2.1 As detailed within **PEI Report Volume 2 Part B Sections 1-7 Chapter 6 Water Environment and Flood Risk**, aquatic environment receptors include WFD surface water bodies ('WFD water bodies'), IDB-maintained watercourses and ordinary watercourses. Such aquatic environment receptors can be affected through deterioration in their water quality via generation of sediment laden runoff or through mobilisation of contaminants from contaminated soil or accidental spillage of pollutants. Increased sediment inputs or direct watercourse disturbance during the installation of culverted crossings may also impact the hydromorphology and flow conveyance of aquatic environment receptors.

5.2.2 Where possible, the design of the Project and siting of the draft Order Limits and Refined Weston Marsh Siting Zone has sought to avoid sensitive water environment and flood risk receptors (as described within **PEI Report Volume 2 Part B Sections 1-7 Chapter 6 Water Environment and Flood Risk**).

5.2.3 Across the route of the Project, there are 35 WFD water body catchments and 22 main rivers, along with many networks of IDB-maintained watercourses and ordinary watercourses (aquatic environment receptors) within the Study Area[1]. The number of aquatic environment receptors within the Study Area for each Section of the Project is detailed in **Table 5.1**.

[1] Study Area established as the extent of the draft Order Limits and Refined Weston Marsh Siting Zone plus a 500 m buffer has been used as the study area for the PEI Reports

Table 5.1 Aquatic environment receptors within each Section of the Project

Section of Project	Aquatic Environment Receptor present within Project Study Area			
	WFD Water bodies	IDB-maintained watercourses	Ordinary watercourses	Main River
Section 1 New Grimsby West Substation	Two WFD water bodies (Mawnbridge Drain and Laceby Beck).	One IDB-maintained watercourse (Mawnbridge Drain Branch 3, Drain Number 4C).	A network of heavily modified or artificial drainage channels mainly in the form of field drains.	No main rivers.
Section 2 New Grimsby West Substation to New Lincolnshire Connection Substation A	14 WFD water bodies (Mawnbridge Drain; Laceby Beck; Buck Beck from Source to N Sea; Waithe Beck lower catchment (to Tetney Lock); New Dike Catchment; Land Dike Drain to Louth Canal (West); Poulton Drain Catchment; Black Dyke Catchment; Louth Canal; South Dike and Grayfleet Drain; Long Eau; Great Eau; Trusthorpe Pump Drain; and Woldgrift Drain).	There is a network of heavily modified or artificial drainage channels mainly in the form of field drains along arable field boundaries under control and management of the IDBs.	There is a network of heavily modified or artificial drainage channels (as well as watercourses under other designations) mainly in the form of field drains along arable field boundaries.	11 main rivers (Laceby Beck, Waithe Beck, Old Fleet Drain, Black Leg Drain, Poulton Drain, Louth Canal, Stewton Beck, River Lud, Grayfleet Drain, Long Eau and Great Eau).
Section 3 New Lincolnshire Connection Substations A and B	Two WFD water bodies (Woldgrift Drain and Boygrift Drain).	Three IDB-maintained watercourses, one in the vicinity of LCS A and two south of LCS B.	There is a network of heavily modified or artificial drainage channels (as well as watercourses under other designations) mainly in the form of field drains	One main river (Wold Grift Drain).

Section of Project	Aquatic Environment Receptor present within Project Study Area			
	WFD Water bodies	IDB-maintained watercourses	Ordinary watercourses	Main River
			along arable field boundaries.	
Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone	14 WFD water bodies (Boygrift Drain; Anderby Main Drain; Willoughby High Drain; Ingoldmells Main Drain; Wedlands and North Drains; Cow Bank Drain; Lymn/Steeping; East & West Fen Drains; Maud Foster and Fen Catchwater Drain; Lower Witham – conf Bain to Grand Sluice; Black Sluice IDB draining to the South Forty Foot Drain; Fosdyke Bridge Outfall; Risegate Eau; and Welland).	There is a network of artificial or heavily modified IDB watercourses within Lindsey Marsh Drainage Board, Witham Fourth District IDB, Black Sluice IDB and Welland and Deepings IDB that are all reliant on pumping stations to maintain water levels within the catchments.	Network of heavily modified or artificial drainage channels (as well as watercourses under other designations) mainly in the form of field drains along arable field boundaries.	Seven main rivers (Willoughby High Drain, Little River Lymn and Cowcroft Drain, River Steeping, East Fen Catchwater, West Fen Catchwater, River Witham and South Forty Foot Drain).
Section 5 Refined Weston Marsh Substation Siting Zone	Six WFD water bodies (Risegate Eau; Welland; Glen; Whaplode River; Vernatt's Drain; and Moulton River)	There is a network of heavily modified or artificial drainage channels mainly in the form of field drains along arable field boundaries under control and management of the IDBs. Some include (but are not limited to) Crowtree	Network of heavily modified or artificial drainage channels (as well as watercourses under other designations) mainly in the form of field drains along arable field boundaries.	Two main rivers (River Welland and River Glen).

Section of Project	Aquatic Environment Receptor present within Project Study Area			
	WFD Water bodies	IDB-maintained watercourses	Ordinary watercourses	Main River
		Connection; New Drain; Lord's Drain; and Wykeham Drain.		
Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation	Five WFD water bodies (Moulton River; South Holland Main Drain; Whaplode River; North Level Main Drain; and Nene).	Two large IDB-maintained watercourses (South Holland High Main Drain and North Level Main Drain). There is also a network of artificial or heavily modified IDB watercourses within the South Holland IDB, North Level IDB and King's Lynn IDB that are reliant on pumping stations along the South Holland Main Drain, North Level Main Drain and the River Nene respectively to maintain water levels within the catchments.	Network of heavily modified or artificial drainage channels (as well as watercourses under other designations) mainly in the form of field drains along arable field boundaries.	One main river (River Nene).
Section 7 New Walpole B Substation	Two WFD water bodies are indirectly connected[2] with Section 7 (Babingley River and South Holland Main Drain).	Two IDB-maintained watercourses (Harfords Dyke and Rose and Crown Drain). There are also arterial watercourses maintained by Kings Lynn	Network of heavily modified or artificial drainage channels (as well as watercourses under other designations) mainly in the form of field	No main rivers.

[2] The Section 7 Study Area is located within the North West Norfolk Management Catchment and North West Norfolk Rivers Operational Catchment. There are no WFD water bodies within the Section 7 Study Area, however two reportable water bodies in the same operational catchment are indirectly connected with Section 7.

Section of Project	Aquatic Environment Receptor present within Project Study Area			
	WFD Water bodies	IDB-maintained watercourses	Ordinary watercourses	Main River
		IDB to maintain drainage within the catchment to Islington Pumping Station, including Harfords Dyke and the Rose and Crown Drain. Artificial or heavily modified morphology, not part of a reportable WFD water body.	drains along arable field boundaries.	
Total	**35**	**Networks within all Section Study Areas**	**Networks within all Section Study Areas**	**22**

5.2.4 Taking into account of the proposed embedded mitigation measures detailed in the Preliminary Code of Construction Practice (CoCP) provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary CoCP** (including W04, W06 and W10), and the magnitude of impacts, no likely significant effects during construction or operation are reported upon the aquatic environment receptors listed in the table above, or on the water resource receptors considered in **PEI Report Volume 2 Part B Sections 1-7 Chapter 6 Water Environment and Flood Risk**.

5.2.5 The draft Order Limits and Refined Weston Marsh Siting Zone of the Project have been located to avoid sensitive Environment and Flood Risk receptors, where practicable. This is consistent with the sequential approach to management of flood risk advocated in NSP EN-1 (Ref 1) and the National Planning Policy Framework (NPPF) (Ref 2).

5.2.6 These design decisions and the application of embedded measures detailed in the Preliminary CoCP mean that likely significant effects are not anticipated upon flood risk receptors in Sections 1 – 3 during the construction phase of the Project and Sections 1, 2, 3, 4 and 6 during the operation and maintenance phase. However, notwithstanding these design decisions and measures, and given current uncertainty around magnitude of impacts and requirements for additional mitigation, likely significant effects are still reported on the following flood risk receptors in **PEI Report Volume 2 Part B Sections 1-7 Chapter 6 Water Environment and Flood Risk** during the construction and operation and maintenance phases (summarised in **Table 5.2** below).

Table 5.2 Likely significant effects of the Project on flood risk receptors

Receptor	Relevant Route Section/s	Impact	Value of receptor	Magnitude of impact	Significance of effect	Rationale
Construction Phase						
Property and Infrastructure at risk of flooding	Sections 4 – 7.	Changes to fluvial flood risk associated with loss of floodplain storage and/or change in floodplain flow conveyance	Essential infrastructure (very high), residential infrastructure (high), commercial infrastructure and local roads (medium) and agricultural land and undeveloped land (low)	Medium adverse effect on flood risk due to potential loss of floodplain storage and/or change in floodplain flow conveyance. Minor to major adverse effect on flood risk receptors.	Significant	Large scale nature of the proposed works and sensitivity of flood risk receptors.
Operation and maintenance						
Property and Infrastructure at risk of flooding	Section 5 and 7.	Changes to fluvial flood risk associated with loss of floodplain storage and/or change in floodplain flow conveyance	Essential infrastructure (very high), residential infrastructure (high), commercial infrastructure and local roads (medium) and agricultural land and undeveloped land (low)	Large adverse effect on flood risk due to permanent loss of floodplain storage capacity. Major to moderate adverse effect on flood risk receptors.	Significant	Large scale nature of the proposed works and sensitivity of flood risk receptors. There is also uncertainty around magnitude of impacts and requirements for additional mitigation at this stage.

Preliminary Flood Risk Assessment Summary

5.2.7 A preliminary Flood Risk Assessment (pFRA) has been prepared to provide an understanding of the risk of flooding during the construction and operation phases of the Project. The pFRA is provided as an appendix to this chapter (**PEI Report Volume 3 Part C Appendix 5A Preliminary Flood Risk Assessment**).

5.2.8 The Study Area[3] of the Project traverses the Anglian river basin and the Humber river basin and five Environment Agency management catchments, with the Environment Agency's Statutory Main River Map (Ref 4) showing 22 main rivers to be present within the Study Area. Numerous ordinary watercourses are also present within the Study Area.

5.2.9 The Environment Agency's Flood Map for Planning (Ref 5) shows the northernmost region of the Study Area, from Grimsby to Alford, to lie predominantly within Flood Zone 1, with the Study Area traversing areas of Flood Zones 2 and 3. The areas of Flood Zones 2 and 3 are associated with the main rivers which flow in a northeasterly direction to the coast. The dominant source of flood risk in the north is predominately fluvial. The central and southern parts of the Study Area, from Alford to Walpole St Andrew, lie predominantly within Flood Zones 2 and 3, with the dominant source of flood risk predominantly tidal. These areas benefit from the presence of formal flood defences. In the central and southern parts of the Study Area the flood risk is predominantly tidal. However, given the low-lying nature of the existing topography, the presence of numerous main rivers, IDB-maintained watercourses and ordinary watercourses the risk of flooding is likely to be a complex interaction between fluvial, tidal and surface water flood mechanisms.

5.2.10 The bedrock in the northern part of the Study Area is shown to be classified as a principal aquifer and is expected to exhibit high permeability. The areas of sandstone, interbedded mudstone and limestone are classified as Secondary aquifers[4] with varying degrees of permeability, whilst the mudstone shown to underly the southernmost part of the Study Area is classified as unproductive strata[5] with low permeability. Given the varying geology throughout the Study Area, the low-lying nature of the existing topography, the proximity to the coastline, and the presence of numerous main rivers and LLFA/IDB-maintained watercourses, groundwater poses a potential risk of flooding to the Project. A summary of the geology and hydrogeology anticipated to underlie the Project Study Area is provided in **PEI Report Volume 2 Part B Section 1-7 Chapter 7 Geology and Hydrogeology.**

5.2.11 The design process sought to ensure that the Project is sited in the lowest flood risk areas where practicable, whilst acknowledging the wider aims of the Project and the extensive flood risk present throughout the region. The sequential approach has been adopted to locate the pylons associated with the proposed overhead line elements of the Project outside of those areas identified as being subject to a risk of

[3] Study Area established as the extent of the draft Order Limits and Refined Weston Marsh Siting Zone plus a 500 m buffer has been used as the study area for the pFRA.

[4] Secondary A aquifers comprise permeable layers that support local water supplies and can act as a source of base flow to rivers. Secondary B aquifers are mainly lower permeability layers that may store and yield limited amounts of groundwater through fissures and openings or eroded layers. Secondary undifferentiated aquifers are those where it is not possible to apply either a Secondary A or B definition due to the variable characteristics of the rock type.

[5] Unproductive strata is largely unable to provide usable water supplies and are therefore unlikely to be relied upon by surface water and wetland ecosystems.

flooding from any source, wherever practicable. Avoidance of areas with a high probability of flooding was a key consideration in the routing of the overhead line and siting of substations. A wide range of potential options was considered, and flood risk was one of the environmental constraints used to inform the selection of a preferred overhead line route and location of substations.

5.2.12 Construction of the overhead line and the substations has the potential to increase the risk of tidal, fluvial, surface water and groundwater flooding where these activities are to be located in areas identified as being at a risk of flooding. The increased risk predominantly relates to loss of floodplain storage or a change in floodplain conveyance, an increase in impermeable surfacing or through the obstruction or diversion of existing surface water flow path.

5.2.13 Lattice pylons, such as those proposed to be used in the Project, do not displace significant volumes of water and pose minimal obstruction to water flow. Therefore, where pylons are required to be located within areas identified as being at risk of flooding, they will not significantly affect floodplain storage or conveyance during operation (refer to **Table 5.2** for details on the flood risk receptors potentially affected during the operation and maintenance phase of the Project). Furthermore, pylons are resilient to water damage from occasional flooding and the conductors are located sufficiently above the highest flood level conceivable over the lifetime of the Project, ensuring that they will remain operational during a flood event and will not pose a safety risk. If it is not possible to take the sequential approach, the Exception Test will be applied to ensure the infrastructure is safe for its lifetime without increasing flood risk. The risk of flooding from the overhead line elements of the Project during the operation phase is considered to be low.

5.2.14 Annual probabilities associated with the flood events used to define each Flood Zone, are shown on the Environment Agency's Flood Map for Planning (Ref 5) and detailed in Paragraph 078 of the Flood Risk and Coastal Change PPG (Ref 6). The probability of surface water flooding in the locations of each of the new substations ranges from 'Very Low' to 'High' but is not considered to present a significant risk. The following summarises the preliminary assessment of the risk of flooding posed to the substations:

i. New Grimsby West Substation (Section 1) and New Lincolnshire Connection Substations A and B (Section 3) is located wholly within Flood Zone 1 and therefore there is a 'Low' probability of flooding from fluvial and tidal sources. Areas of land within the Study Area surrounding LCS-B are shown to lie within Flood Zones 2 and 3, with the predicted peak flood extents shown to be associated with the Woldgrift Drain, an Environment Agency designated main river. Consequently, the FRA submitted in support of the DCO application for the Project will include a detailed assessment of the expected increase in fluvial flood risk posed as a result of the anticipated impacts of climate change. These substations are also identified to be a 'Very Low' risk of surface water flooding. These substations are located in areas where the underlying bedrock is classified as a principal aquifer and is therefore anticipated to exhibit high permeability and a risk to groundwater flooding.

ii. The majority of Section 5 Refined Weston Marsh Substation Siting Zone is located within Flood Zone 3 and therefore there is a 'High' probability of flooding. A small area within the siting zone is located within Flood Zone 2 and therefore there is a 'Medium' probability of flooding. Ongoing consultation with the Environment Agency has identified that the dominant flooding mechanism in the

vicinity of the Siting Zone is expected to be tidal. The location of the substation within the siting zone is yet to be determined and will be confirmed at statutory consultation. The FRA to be submitted as part of the ES will include a detailed assessment of the risk of flooding posed to the proposed new substations using the outputs of existing hydraulic modelling studies. The Refined Weston Marsh Substation Siting Zone is underlain by bedrock classified as unproductive strata which has a negligible significance for water supply or baseflows to rivers, lakes and wetlands.

iii. New Walpole B Substation (Section 7) is located within Flood Zone 3 and therefore, has a 'High' probability of flooding from fluvial and tidal sources. Ongoing consultation with the Environment Agency has identified that the dominant flooding mechanism in the vicinity of the Section 7 draft Order Limits is expected to be tidal. The FRA to be submitted as part of the ES will include a detailed assessment of the risk of flooding posed to the proposed new substation using the outputs of existing hydraulic modelling studies. The indicative new substation boundary is underlain by bedrock consisting of strata with low permeability that naturally offers protection to any aquifers that may be present beneath.

5.2.15 Control mitigation measures, comprising management activities and techniques, will be implemented during construction of the Project to limit effects through adherence to good practices and achieving legal compliance. **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice (CoCP)** contains a list of relevant good practice measures relating to Flood Risk and referenced within the Preliminary CoCP.

5.2.16 The FRA to be submitted as part of the ES will set out the mitigation measures required to ensure that the Project is designed to remain safe and operational, without increasing flood risk elsewhere in accordance with the requirements of NPS EN-1 (Ref 1). An outline Surface Water Drainage Strategy (SWDS) will be presented in the FRA to demonstrate how surface water runoff will be managed in a sustainable manner commensurate with the relevant policies and best practice guidance.

The Sequential Test

5.2.17 Consideration has been given on a route-wide basis as to how the Project has aligned with the Sequential Test policy set out in paragraphs 170 – 176 of the NPPF (Ref 2).

5.2.18 The purpose of the Sequential Test, which is described in more detail in paragraphs 3.4.10 – 3.4.12 in the Corridor Preliminary Routing and Siting Study (CPRSS) (Ref 7), is to ensure that a sequential, risk-based approach is followed to 'steer new development to areas with the lowest risk of flooding from any source' as stated in the NPPF (Ref 2).

5.2.19 National Grid Electricity Transmission plc (National Grid) has been through an iterative options appraisal process to determine the preferred option for the Project, with consideration given to a wide range of criteria including environmental, socio-economic, technical, and cost factors throughout the process. This process is presented in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** which summarises the outcomes of the Strategic Options Report (SOR), the CPRSS, the non-statutory consultation undertaken on the graduated swathe developed as part of the CPRSS and the work subsequently undertaken to further develop the Project. At the CPRSS stage a sequential approach was taken in the

selection of the overhead line route corridor and substation siting zones and siting areas, with flood risk being considered throughout the process alongside other constraints. This process sought to ensure that the Project is sited in the lowest flood risk areas where practicable, whilst acknowledging the wider aims of the Project and the extensive flood risk present throughout the region.

5.2.20 In accordance with the requirements of NPS EN-1 (Ref 1), the sequential approach will continue to be applied as the Project progresses to minimise risk by directing the most vulnerable uses to areas of the lowest flood risk, including residual risk where applicable.

The Exception Test

5.2.21 The Project, which is essential infrastructure as defined by NPPF, has to pass through Flood Zones 3a and 3b. As such, following the application of the Sequential Test, the application of the Exception Test will be required for any permanent overhead line and substation infrastructure proposed to be located in Flood Zone 3a or Flood Zone 3b.

5.2.22 In accordance with the NPPF (Ref 2), both parts of the Exception Test will need to be satisfied for the Project to be consented:

i. Part (a) of the Exception Test requires the Project to provide wider sustainability benefits to the community that outweigh flood risk.

ii. Part (b) of the Exception Test requires that the Project will be safe for its lifetime, taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall. As noted in the PPG, ‘Essential infrastructure’ proposed in Flood Zone 3a should also be designed and constructed to remain operational and safe in times of flood.

5.2.23 Evidence will be provided within the FRA to be submitted in support of the DCO application for the Project to inform the application of parts (a) and (b) of the Exception Test.

References

Ref 1 Department of Energy Security & Net Zero (2024). Overarching National Policy Statement for Energy (EN-1) [online]. Available at: https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1 [(Accessed December 2024].).

Ref 2 Ministry of Housing, Communities and Local Government (2024). National Planning Policy Framework [online]. Available at: https://www.gov.uk/guidance/national-planning-policy-framework [Accessed 20 January 2025].

Ref 3 Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive [online]. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-the-water-framework-directive

Ref 4 Environment Agency, 2025. Statutory Main River Map. [online] Available at: https://www.arcgis.com/apps/webappviewer/index.html?id=17cd53dfc524433980cc333726a56386

Ref 5 Environment Agency, 2025. Flood Map for Planning. [online] Available at: https://flood-map-for-planning.service.gov.uk/ [Accessed 14 April 2025].

Ref 6 Ministry of Housing, Communities and Local Government (2024). Flood Risk and Coastal Change Planning Practice Guidance. Available at https://www.gov.uk/guidance/flood-risk-and-coastal-change [Accessed December 2024].

Ref 7 National Grid (January 2024).Available at: https://www.nationalgrid.com/document/352621/download (Accessed 4 June 2024).

6. Agriculture and Soils

nationalgrid

Contents

6. Agriculture and Soils

6.1 Introduction

6.1.1 This chapter presents an assessment of the route-wide preliminary impacts and likely significant effects of the Grimsby to Walpole Project (the Project) on Agricultural Land Classification (ALC), specifically the potential temporary and permanent loss of Best and Most Versatile (BMV) land from agricultural productivity in accordance with **Preliminary Environmental Information (PEI) Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Impacts and significant effects of the Project on BMV land at a Section-level are reported in **PEI Report Volume 2 Part B Section 1-7 Chapter 8 Agriculture and Soils**.

6.1.2 Potential impacts of the Project on soil function and agricultural landholdings are not considered to require a route-wide assessment and are therefore only considered at a Section-level in **PEI Report Volume 2 Part B Section 1-7 Chapter 8 Agriculture and Soils**. As potential impacts upon these receptors are localised, if the total effect upon soil function and agricultural landholdings were to be considered at a route-wide level, it is anticipated that the outcome of the assessment would not be different to that reported at a Section-level.

6.1.3 For the purpose of this assessment, it is assumed that all land within the draft Order Limits and Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) of the Project may be temporarily impacted and temporarily removed from agricultural production during the construction phase.

6.1.4 BMV land may be required permanently for substations, pylons and access routes and temporarily for construction compounds and haul roads. The BMV land grades affected permanently by the Project will be confirmed following the completion of on-going ALC surveys and will be fully assessed in the Environmental Statement (ES) submitted with the Development Consent Order (DCO) application.

6.2 Route-Wide Summary of Effects

6.2.1 The ALC grades used in this preliminary assessment have come from provisional ALC mapping, at a scale of 1:250,000, which does not split Grade 3 land into Subgrades 3a and 3b. Subgrade 3a land, along with Grade 1 and Grade 2 land, comprises BMV agricultural land. The splitting of Grade 3 land will be confirmed through a detailed ALC survey that is being conducted to support the assessment at ES stage and will be appended to the ES Agriculture and Soils chapters as part of the DCO application.

Loss of BMV Land

6.2.2 **Table 6.1** summarises the amount of BMV land required temporarily during construction of each Section, the amount of this BMV land then reinstated by the end of the construction phase and the amount of BMV land that cannot be reinstated and is therefore considered to be lost permanently.

6.2.3 During construction of the Project, agricultural land would be required temporarily for construction compounds, construction of infrastructure, and the stringing of conductors between pylons.

6.2.4 During the operation of the Project, the majority of land taken temporarily by the Project during construction would have already been reinstated and returned to agricultural use, whilst land taken for the permanent infrastructure required for the Project would remain out of agricultural use.

Table 6.1 Total BMV land lost temporarily and permanently per Section of the Project

Project Section	Total BMV land lost temporarily during construction (ha)	Total BMV land reinstated post construction (ha)	Total BMV land lost permanently through operation (ha)
Section 1: New Grimsby West Substation	86.3 ha of Grade 3 land.	57.6 ha of Grade 3 land.	28.7 ha of Grade 3 land.
Section 2: New Grimsby West Substation to New Lincolnshire Connection Substation A	700.2 ha of Grade 3 land.	582.3 ha of Grade 3 land.	117.8 ha of Grade 3 land.
Section 3: New Lincolnshire Connection Substations A and B	178.5 ha of Grade 2 and Grade 3 land.	111.6 ha of Grade 2 and Grade 3 land.	66.9 ha of Grade 2 and Grade 3 land.
Section 4: New Lincolnshire Connection Substation B to Refined Weston Marsh Substation	1104.4 ha of Grade 1, Grade 2 and Grade 3 land.	957.2 ha of Grade 1, Grade 2 and Grade 3 land.	147.2 ha of Grade 1, Grade 2 and Grade 3 land.
Section 5: Refined Weston Marsh Substation Siting Zone	See below for explanation		
Section 6: Refined Weston Marsh Substation to New Walpole B Substation	481.1 ha of Grade 1 and 2 land.	422.5 ha of Grade 1 and Grade 2 land.	58.6 ha of Grade 1 and Grade 2 land.
Section 7: New Walpole B Substation	104.8 ha of Grade 1 and 2 land.	50.7 ha of Grade 1 and Grade 2 land.	54.1 ha of Grade 1 and grade 2 land.
Total	**2655.3 ha**	**2181.9 ha**	**473.3**

6.2.5 The assessment for Section 5 is based on a Refined Siting Zone Boundary, which provides flexibility regarding ongoing design definition. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Refined Siting Zone or limits of deviation. This reflects the current maturity of design development for Section 5. Once additional design detail is known, the preliminary assessment will be reviewed and updated as required to inform further, localised consultation on Section 5. As such, the route-wide preliminary assessment presented below does not include land within Section 5. The land within Section 5 will be considered within the route-wide assessment conducted at ES stage once the design has been finalised.

6.2.6 The siting area is characterised by land classified as ALC Provisional Grade 1 (Excellent). Grade 1 land is considered to have a Very High sensitivity. The permanent loss of land within the siting area is considered likely to give rise to a significant adverse effect due to the size of the substation(s) and the resulting permanent loss of Provisional Grade 1 land.

6.2.7 The total area of land required during the construction of the Project (excluding Section 5) is approximately 3,909.5 ha, of which 2,655.3 ha (67.9 per cent) comprises BMV land. BMV land is a resource of very high to high sensitivity and the temporary loss of 2655.3 ha route-wide will result in an impact of small magnitude (based on this being temporary, reversible loss and the permanent loss being assessed separately below) and a major to moderate adverse effect, which is considered significant.

6.2.8 By the end of the construction phase, 2181.9 ha of BMV land would have been reinstated to its pre-construction condition through the implementation of effective soil handling, storage and reinstatement measures which will be detailed in an Outline Soil Management Plan (SMP) to be submitted as part of the DCO application. The implementation of measures detailed in the Outline SMP will be critical in ensuring the minimisation of effects on BMV land and their successful restoration.

6.2.9 Monitoring may be required during the aftercare period. The Outline SMP will set out the commitments associated with the aftercare period, with full details confirmed prior to the end of construction of the Project and prior to any land hand back.

6.2.10 As such, the extent of BMV land lost permanently (excluding Section 5) is approximately 473.3 ha, representing 17.8 per cent of the total area of BMV land affected by the Project. BMV land is a resource of very high to high sensitivity and the permanent loss of 473.3 ha route-wide will result in an impact of large magnitude and a major to moderate adverse effect, which is considered to be significant.

6.2.11 As such, when considering the temporary and permanent loss of BMV land at a route-wide level, it is concluded that that there is no change to the assessment reported at a Section-level in **PEI Report Volume 2 Part B Section 1-7 Chapter 8 Agriculture and Soils**.

7. Socio-economics, Recreation and Tourism

nationalgrid

Contents

7. Socio-economics, Recreation and Tourism

7.1 Introduction

7.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the route-wide assessment of Socio-economics, recreation and tourism of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:

i. An introduction to the topic (section 1.1);

ii. Identification of key local and regional policy relevant to the assessment (section 1.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;

iii. A summary of the assessment scoping process and the subsequent scope of the Socio-economics, recreation and tourism assessment (section 1.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;

iv. A high-level summary of the methodology of the Socio-economics, recreation and tourism assessment (section 1.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;

v. A description of the environmental baseline relevant to the Socio-economics, recreation and tourism assessment (section 1.5);

vi. A description of mitigation measures included for the purposes of the Socio-economics, recreation and tourism assessment reported within the PEI Report (section 1.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**;

vii. The likely significant and non-significant Socio-economics, recreation and tourism effects arising during construction of the Project, based upon the assessment completed to date (section 1.7); and

viii. An outline of the proposed monitoring requirements in relation to Socio-economics, recreation and tourism (section 1.8).

7.1.2 Further supporting information is set out in **Table 7.1** below, including supporting figures and technical appendices.

Table 7.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part C Figures	**Figure 7.1– Route-wide Assessment Receptors within Study Area**
Project Supporting Documentation	
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of National and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	A summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The Preliminary Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

7.1.3 There are also interrelationships between potential effects on Socio-economics, recreation and tourism and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C** that relate to the potential impacts upon affected communities and strategic visitor attractions in this chapter:

i. **PEI Report Volume 2 Part B Sections 1-7 Chapter 3 Visual** should be consulted in relation to the viewpoint assessment. This helps to inform the baseline description and supports the assessment of effects on the landscape.

ii. **PEI Report Volume 2 Part B Sections 1-7 Chapter 9 Traffic and Movement** assesses the potential change in traffic movements during construction and operation, which is relevant to the assessment of Socio-economics, recreation and tourism effects through potential impacts for affected communities by way of traffic, plant and machinery and erection of the overhead lines, substations and associated works which may have effects on access.

iii. **PEI Report Volume 2 Part B Sections 1-7, Chapter 10 Noise and Vibration** includes detail of the potential impacts of construction noise upon sensitive receptors which is relevant to the assessment of Socio-economics, recreation and tourism effects through potential impacts for affected communities by way of traffic, plant and machinery and erection of the overhead lines, substations and associated works which may cause noise and vibration effects

iv. **PEI Report Volume 2 Part B Sections 1-7 Chapter 12 Air Quality** includes detail of the potential impacts of any changes in air quality upon sensitive receptors which is relevant to the assessment of Socio-economics, recreation and tourism effects through potential impacts for affected communities by way of traffic, plant and machinery and erection of the overhead lines, substations and associated works which may have dust effects.

v. **PEI Report Volume 2 Part C Chapter 8 Health and Wellbeing** includes detail of potential impacts upon X which is relevant to the assessment of Socio-economics, recreation and tourism effects through potential health impacts on affected communities through access, dust, noise and vibration effects; and

vi. **PEI Report Volume 2 Part C Chapter 10 Cumulative Effects** (noting this presents a preliminary assessment of cumulative effects upon common receptors across environmental topics identified within PEI Report Volume 2 Part B (intra-project) and identifies a shortlist of other Committed Developments with which there may be potential for cumulative effects and the relevant environmental topics for such effects (inter-project).The full cumulative effects assessment will be reported within the ES.

7.2 Legislation and Policy Framework

7.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, the details of which are set out in **Table 7.1**.

Regional and Local Policy

7.2.2 Regional and local plans or policies relevant to this assessment are as follows:

i. **Lincolnshire County Council Minerals and Waste Local Plan** (Ref 21);

- Lincolnshire Minerals and Waste Local Plan: Core Strategy and Development Management Policies; and Site Locations – which outlines the principles and locations for the future working of minerals and the form of waste management, of which may affect the construction employment supply chain (availability and processing of materials and waste) and movements of construction vehicles.

ii. **Cambridgeshire County Council Minerals and Waste Local Plan** (Ref 33);

- Cambridgeshire Minerals and Waste Local Plan: Core Strategy and Development Management Policies – which outlines the principles for the future working of minerals and the form of waste management. See comments applied to Minerals and Waste Local Plan above.

iii. **Norfolk Minerals and Waste Development Framework** (Ref 34);

- Policy CS16: Safeguarding mineral and waste sites and mineral resources – this policy outlines the principles for the future working of minerals and the form of waste management, including the criteria under which applications are considered. See comments applied to Minerals and Waste Local Plan above.

iv. **East Lindsey District Council Local Plan** (Ref 17);

- Strategic Policy 13 – Inland Employment – which sets out that the Council will support growth and diversification of the local economy by identifying and protecting additional land employment uses.
- Strategic Policy 15 Widening the Inland Tourism and Leisure Economy – which sets out that the Council will support sustainable inland tourism in East Lindsey, ensuring developments enhance and diversify the tourism and leisure economy.

v. **South East Lincolnshire Local Plan** (Ref 16);

- Policy 7 Improving South East Lincolnshire's Employment Land Portfolio – which stipulates that the Council supports proposals which enhance the region's employment land portfolio to promote economic prosperity and job creation. It focuses on achieving employment targets across various employment classes within different districts.
- Policy 8 Prestige Employment Sites – which identifies employment sites for the plan area, and sets out general principles for development to include delivery of a mix of employment opportunities that include the target sector of the visitor economy.
- Policy 9 Promoting a Strong Visitor Economy - which sets out that the Council will support tourism in South East Lincolnshire and promote developments that enhance the local economy, communities and visitors.

vi. **North East Lincolnshire Council Local Plan** (Ref 18);

- Policy 1 Employment land supply – which provides a portfolio of sites to enable economic development.
- Policies 7 & 8 Employment allocations – which allocates new employment sites and includes policy provisions for existing sites within the plan area.
- Policy 12 Tourism and Visitor Economy - which stipulates that the Council supports fostering a robust visitor economy by supporting tourism developments (including 'green tourism' facilities) that drive economic growth and strengthen local communities.

vii. **Emerging North East Lincolnshire Local Plan** (Ref 35)

- Draft Strategic Policy 16 Tourism and Visitor Economy – which stipulates that the Council supports tourism developments that promote economic growth, benefit local communities, and expand visitor accommodation to enhance the region's appeal and sustainability as a destination.

viii. **Central Lincolnshire Local Plan** (Ref 9);

- Policy S29 Strategic Employment Sites – identifies a number of land parcels within the local plan area to be ear-marked for the development of strategic employment opportunities to meet large scale investment needs.

- Policies S39-34 – together set out the strategic employment sites allocated within the Local Plan, including those on Sustainable Urban Extensions; and set out the Important Established Employment Areas and Local Employment Areas, as well as the non-designated employment proposals for the settlements and the countryside within the plan area.
- Policy S42 Sustainable Urban Tourism - which sets outs that the Council will support development proposals that foster sustainable tourism and enhance the local economy, benefit communities, and preserve existing visitor facilities within the area.
- Policy S43 Sustainable Rural Tourism – which stipulates that development will be supported where it promotes visitor facilities that enhance local economies and communities while preserving environmental qualities.

ix. **Fenland District Council Local Plan** (Ref 24);

- Policy LP6 Employment, Tourism, Community Facilities and Retail - stipulating that opportunities for employment growth in the district will be maximised to meet additional job targets, identifying a number of land parcels within the local plan area for the development of strategic employment opportunities.

x. **Emerging Draft Fenland District Council Plan** (Ref 10);

- Policy LP3 Spatial Strategy for Employment Development – which outlines the proposed growth approach for the plan area, including site allocations for employment land use.
- Policy LP17 Culture, Leisure, Tourism and Community Facilities- which sets out that the Council will support the safeguarding of existing tourism facilities, stipulating that the loss of such facilities will only be permitted if they are proven unfit for purpose, replaced by equivalent alternatives, or shown to be unviable.

xi. **Kings Lynn and West Norfolk District Council Plan** (Ref 26).

- Policy CS10 The Economy - which sets out that the local economy will be developed sustainably through provision of employment land as well as policies for tourism, leisure, retail and the rural economy; and allocates employment land for development within the plan area.

xii. **Emerging Kings Lynn and West Norfolk District Council Plan** (Ref 36)

- Policy LP07 The Economy Policy – stipulating the Council's aims to develop and diversify the local economy sustainably by promoting job growth, increasing higher-skilled roles, and supporting tourism industries. It identifies the strategic distribution of employment land parcels across different areas to support facilitate job growth.

7.3 Scope of Assessment

7.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 5) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the Environmental Impact Assessment (EIA) Scoping Report (Ref 1). The scope has also been informed through consultation and

engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Socio-economics, recreation and tourism chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement.**

7.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Report**.

7.3.3 The scope of this route-wide assessment covers the following receptor groups:

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

ii. the 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.

7.3.4 Effects upon community-based receptors: local businesses (including local tourism businesses), development land, community facilities, open space, users of Public Rights of Way (PRoW) and promoted/recreational routes and aviation are considered at a Section-level in the assessments within **PEI Report Volume 2 Part B Sections 1-7 Chapter 11 Socio-economics, Recreation and Tourism.** Local tourist attractions are considered as local business receptors at a Section-level in the assessments.

7.3.5 This chapter considers potential indirect and in-combination amenity effects upon affected communities (local communities, including populations of towns and villages) as well as the labour market at a local and regional level. Additionally, this chapter assesses the potential indirect effects upon any strategic visitor attractions within the Study Area that are considered to be of importance to the economy.

7.3.6 As per the as per the EIA Scoping Report (Ref 1), an assessment on the labour market, affected communities and strategic visitor attractions during operation and maintenance of the Project has been scoped out of the assessment as no likely significant effects are anticipated.

7.3.7 Effects on individual properties is outside the scope of Socio-economics, recreation and tourism assessment within PEI Report Volume 2 Parts B and C, with any requirements for compensation to be separately delivered in line with the Compensation Code where losses are incurred due to loss of land or disruption.

7.3.8 Broader tourism and recreation areas or assets include Areas of Outstanding Natural Beauty (AONBs), coastal destinations, associated promoted/recreational routes and open spaces, settlements such as market towns with farmers' markets, specific cultural and heritage attractions and other more local visitor attractions such as caravan parks, campsites, golf courses, horse riding centres, activity centres. These receptors (AONBs and coastal destinations) are assessed within other specific topic chapters in **PEI Report Volume 2 Part B**, such as **Chapter 2 Landscape, Chapter 4 Ecology and Biodiversity, Chapter 6 Water Environment** and **Chapter 3 Visual**. The other receptors listed within this paragraph are assessed within the **Section-level assessment in PEI Report Volume 2 Part B Sections 1-7 Chapter 11 Socio-economics, Recreation and Tourism**. Therefore, the scope of this route-wide

assessment does not include such receptors in order to avoid duplication or double counting the reporting of effects throughout the PEI Report.

7.4 Assessment Methodology

7.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Socio-economics, recreation and tourism assessment conducted within this chapter are set out in in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all described and assigned to the assessment. A summary of the key components is outlined below.

7.4.2 There is limited technical guidance available for Socio-economic, recreation and tourism assessments. As such, the methodology for assessing impacts has followed standard EIA guidance and entails:

i. assessment of the likely scale, permanence and significance of effects associated with Socio-economics, recreation and tourism receptors; and

ii. an assessment of the potential cumulative impacts with other projects within the surrounding area.

7.4.3 The assessment of employment effects, in connection with the assessment of the labour market and impact of the construction workforce, follows the approach set out in the Homes and Communities Agency (HCA) Additionality Guide (Ref 25), which provides guidance on assessing the additional impact (or 'additionality') of local economic interventions, taking into account the potential for leakage, displacement/substitution and supply chain effects[1]. The HCA approach represents standard industry guidance on the assessment of additionality.

Assessment Assumptions and Limitations

7.4.4 All general assumptions and limitations for the for the Socio-economics, recreation and tourism assessment conducted within this chapter are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope.**

7.4.5 These key parameters and assumptions will be reviewed based on the design presented in the DCO application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions used within that assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

7.4.6 For this chapter, an assessment has been provided in regard to the average and peak number of workers expected as a result of construction of the Project during construction. This assessment accounts for the proportion of additional jobs supported regionally in connection with the Project. This information will be refined for

[1] Leakage refers to the proportion of outputs that benefit those outside of an intervention's target area, displacement refers to the proportion of outputs accounted for by reduced outputs elsewhere in the target area and substitution refers to the effect which arises from where a firm substitutes one activity for a similar one (i.e. such as recruiting a jobless person while another employee loses a job) to take advantage of public sector assistance.

the ES as capital expenditure (CaPex) capital costs mature, which is the basis for the estimation on construction employment effects.

7.5 Baseline Conditions

7.5.1 The potential impacts arising from the Project are assessed relative to the baseline conditions and, where appropriate, benchmarked against regional and national standards of the following indicators:

i. population;

ii. the labour market; and

iii. an overview of the economy, including the role of the tourism sector.

7.5.2 This section provides the baseline conditions for the following geographical areas:

i. the local authorities (district and borough councils) of North East Lincolnshire, East Lindsey, West Lindsey, Boston, South Holland, Fenland, and King's Lynn and West Norfolk;

ii. the Yorkshire and the Humber, East Midlands and East of England regions; and

iii. England.

Study Area

7.5.3 The Study Area for this assessment of route-wide Socio-economics, recreation and tourism effects varies dependent on the likely spatial extent of the effect under consideration, as agreed via the Scoping Opinion (Ref 5).

7.5.4 The Study Areas for the components of the Socio-economics, recreation and tourism assessment within this chapter are shown on **PEI Report Volume 2 Part C Figure 7.1 Route-wide Assessment Receptors within the Study Area**. Professional judgement has been applied to determine the Study Area for each receptor type and is consistent with other similar linear Nationally Significant Infrastructure Projects (NSIPs).

7.5.5 For the purposes of this assessment, direct effects can be defined as those which involve loss or severance of land and property. Indirect effects can be defined as impacts on the environment as a result of the Project. For example, a change in a persons' experience of a place.

7.5.6 **Table 7.2** below summarises the Study Areas considered for each receptor type that is considered within this chapter. For the purposes of defining the Study Areas, 'regional and sub-regional level' comprise the spatial extent of the local authority areas through which the draft Order Limits and Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) pass. **Table 7.3** identifies the key urban areas, based on towns identified within the first tier of the settlement hierarchy in each of the respective Local Plans for each Local Authority within the Study Area.

Table 7.2 Study Areas

Receptor Type	Study Area for direct effects	Study Area for indirect effects
Population (including affected communities)	Within the draft Order Limits and Refined Siting Zone	Regional and sub-regional level
Economy and employment (including the labour market)	Within the draft Order Limits and Refined Siting Zone	Regional and sub-regional level
Tourism and recreation (including strategic visitor attractions)	Within the draft Order Limits and Refined Siting Zone	Within 5 km of the draft Order Limits and Refined Siting Zone

Table 7.3 Key settlements within the Study Area

Local Planning Authority	Key settlements in hierarchy
North East Lincolnshire Borough Council Adopted Local Plan (adopted March 2018) (Ref 18) • Policy 3 – Settlement Hierarchy	**Level 1 (Urban areas) comprising:** • Grimsby • Cleethorpes • Great Coates (adjoining parish)
East Lindsey Borough Council Adopted Local Plan Core Strategy (adopted July 2018) (Ref 17) • Strategic Policy 1 (SP1) – A Sustainable Pattern of Places	**Towns** • Louth • Skegness • Alford • Coningsby/Tattershall • Horncastle • Mablethorpe/Sutton/Trusthorpe • Spilsby
West Lindsey District Council– - Central Lincolnshire Local Plan (adopted April 2023) (Ref 9) • Policy S1: The Spatial Strategy and Settlement Hierarchy • Policy S35: Network and Hierarchy of Centres	**Level 1 (Lincoln Urban Area) comprising:** • City of Lincoln • North Hykeham • South Hykeham Fosseway • Waddington Low Fields • Any other developed land adjoining these areas. **Main Towns** • Sleaford • Gainsborough

Local Planning Authority	Key settlements in hierarchy
	Market Towns • Caistor • Market Rasen **Large Villages, Small Villages and Hamlets (as defined in Policy S1)**
South East Lincolnshire Joint Strategic Authority (Ref 16) • Policy 11L Distribution of new Housing	**Sub-regional centre:** • Boston
Fenland District Council Adopted Local Plan (adopted March 2014) (Ref 24) • Policy LP3 – Spatial Strategy, the Settlement Hierarchy and the Countryside	**Primary market towns:** • March • Wisbech
West Norfolk and Kings Lynn Borough Council Local Development Framework – Core Strategy (July 2011) (Ref 26) • Policy CS02 – Settlement Hierarchy	**Sub-regional centre** • King's Lynn (including West Lynn)

Data Collection

7.5.7 The following data has been used to inform the assessment of the baseline conditions:

i. Office for National Statistics (ONS) Census 2021 (Ref 13);

ii. ONS (2024) Mid-year population estimates (Ref 4);

iii. Ministry of Housing, Community and Local Government (now Department for Levelling Up, Housing and Communities), (2019), English Indices of Deprivation (Ref 15);

iv. ONS (2023), Regional Gross Value Added (balanced) per head and income components (Ref 8);

v. ONS (2023), UK Business Register and Employment Survey (Ref 12);

vi. ONS (2018) Population projections (Ref 19); and

vii. Visit Britain (2024), Great Britain Tourism Survey (Ref 6).

7.5.8 The following data was not available at the time of writing this PEI Report but will be included within the ES:

i. Lower level of geographic administrative area, such as ward level data, which may reveal further trends in employment data that are not highlighted here.

ii. Detail relating to the number of construction workers is evolving and further details will be provided at ES stage should National Grid Electricity Transmission plc (National Grid) (National Grid) have updated capital expenditure profiles and more information about the likely construction workforce at that stage.

iii. Detail relating to the supply chain, training and skills is not currently available. An assessment will be undertaken in the ES subject to available information from National Grid.

Existing Baseline

7.5.9 The following section outlines the Socio-economics, recreation and tourism route-wide assessment baseline for affected communities, the labour market and strategic visitor attractions. The baseline section should be read in conjunction with **PEI Report Volume 2 Part C Figure 7.1 Route-wide Assessment Receptors within Study Area**.

Affected communities

Population

7.5.10 At a local level, the estimated population by local authority within the Study Area is presented in **Table 7.4** below. North East Lincolnshire is the largest local authority within the Study Area by population, according to 2022 ONS mid-year population estimates (Ref 14) the estimated population is approximately 157,800. However, as shown in **Image 7.1**, North East Lincolnshire recorded a population decline of 1.7% between 2011 and 2021. Boston, in the East Midlands region, has a population of approximately 70,800, which is the smallest of the local authorities within the Study Area by population. Boston did, however, record the highest population growth of the local authorities within the Study Area of 9.1% between 2011 and 2021.

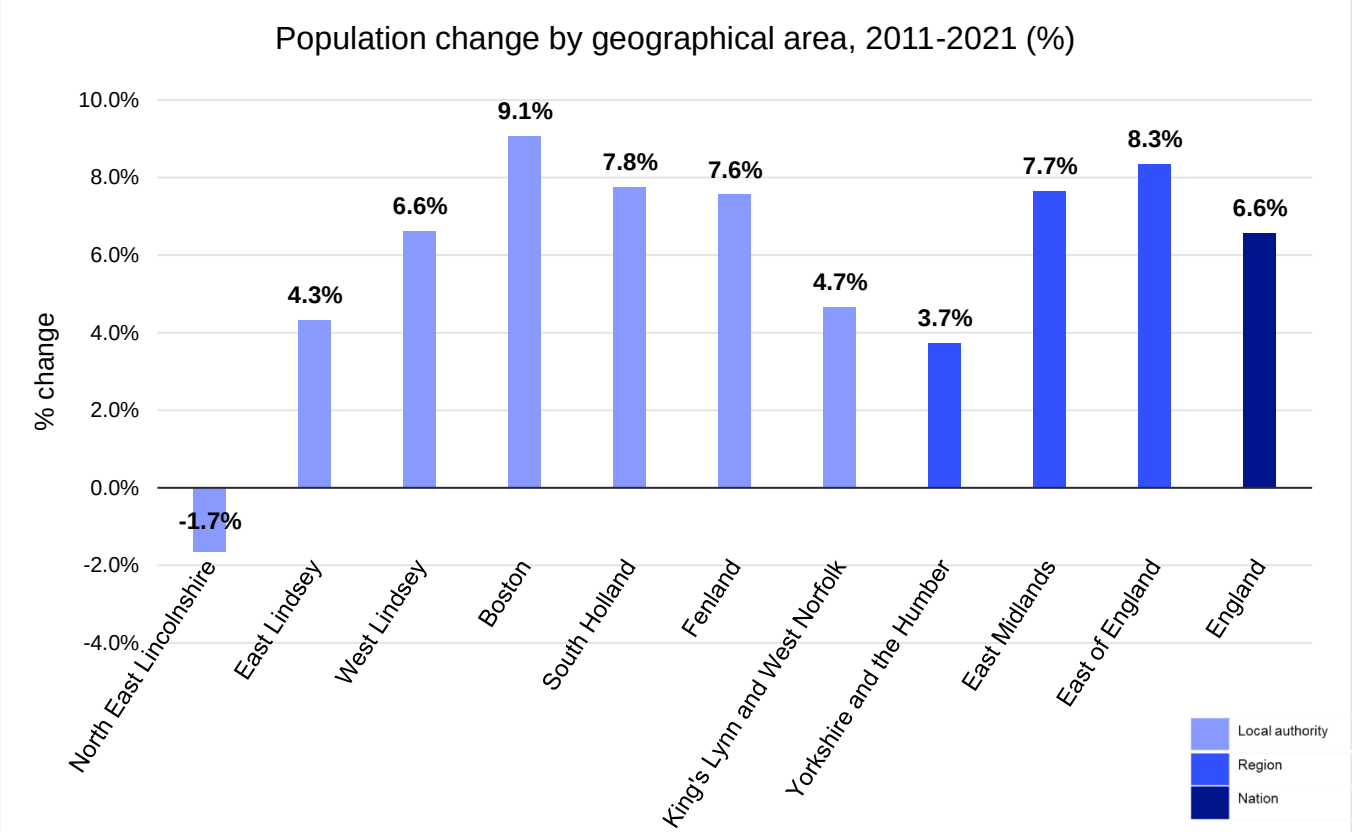
7.5.11 Regionally, the population growth rate in the East Midlands between 2011-2021 was 7.7% and Yorkshire and the Humber recorded a population growth rate of 3.7%, as shown in **Image 7.1** and **Table 7.4**. The East of England recorded the highest population growth rate of the regions within the Study Area of 8.3% between 2011 and 2021, which is higher than the population growth recorded for England as a whole (6.6%).

Table 7.4 Geographical areas by population (Ref 18)

Geographical area	Population
Local authorities	
North East Lincolnshire	157,800
East Lindsey	144,400
West Lindsey	96,800
Boston	70,800
South Holland	97,000
Fenland	103,000
King’s Lynn and West Norfolk	155,800
Regions	

Geographical area	Population
Yorkshire and the Humber	5,541,300
East Midlands	4,934,900
East of England	6,398,500
National	
England	57,106,400

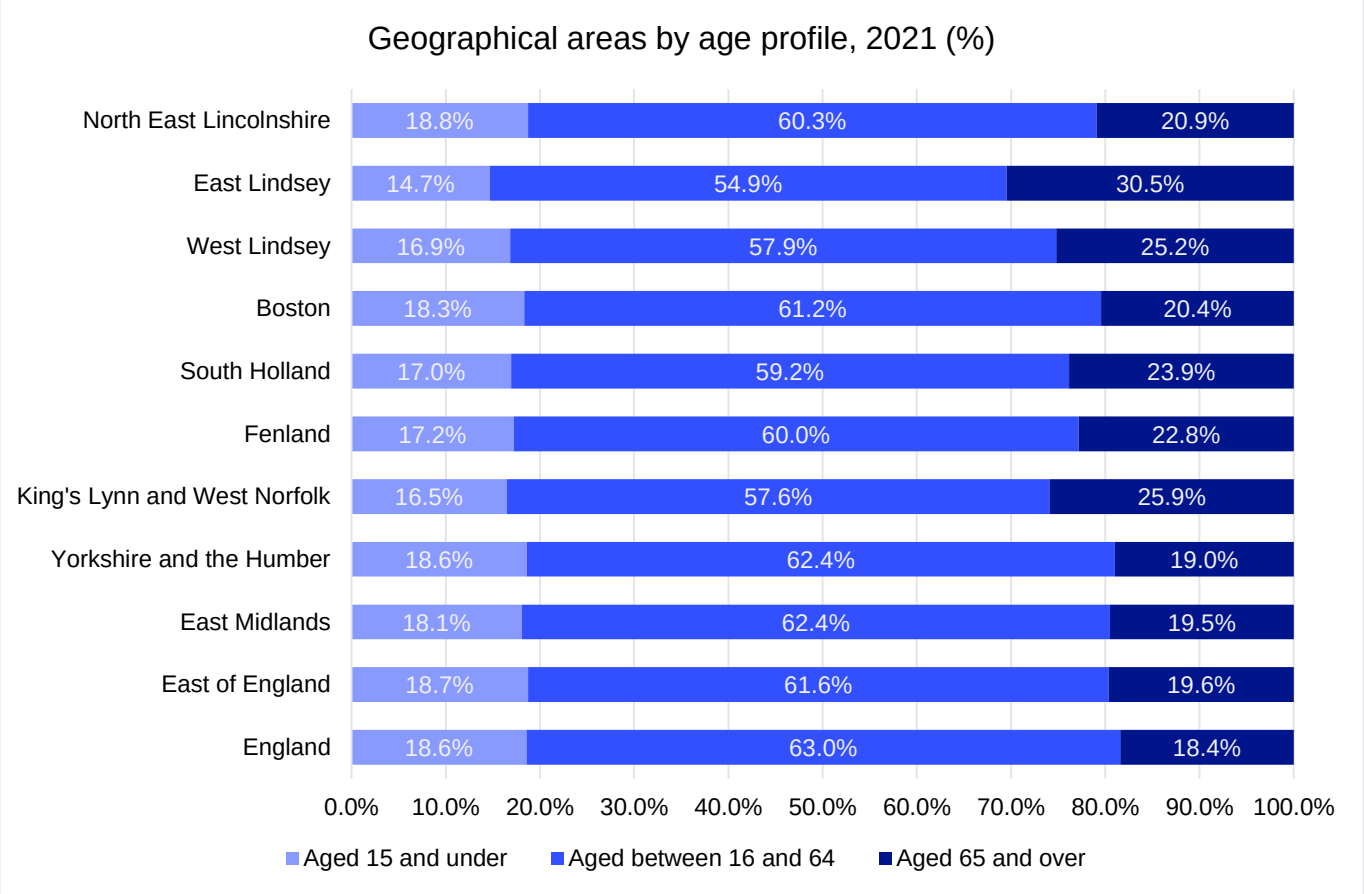
Image 7.1 Population change by geographical area, 2011-2021 (Ref 13 and Ref 27)



7.5.12 **Image 7.2**[2] shows the age profile of the geographical areas within the Study Area. At the local authority level, Boston has the highest proportion of the population that is of working age at 61.2%, and East Lindsey has the lowest proportion with 54.9%.The proportion of the population of working age (aged between 16 and 64) in all local authorities within the Study Area is lower than the regional averages for Yorkshire and Humber (62.4%), East Midlands (62.4%), and East of England (61.2%), as well as the England average of 63%. East Lindsey also has a higher proportion of the population aged 65 and over, at 30.5%, compared to the regional average of 19.5% for the East Midlands and the national average of 18.4% across England as a whole. Boston has the lowest proportion of the population aged 65 and over (20.4%) when compared to the other authority areas, however this is lower than all regions (Yorkshire and the Humber, 19.0%, East Midlands, 19.5%, East of England, 19.6%) and the national (England) proportion (18.4%) of the population aged 65 and over.

[2] Figures have been rounded to one decimal place; therefore, totals may not sum precisely to 100.

Image 7.2 Geographical areas by age profile, 2021 (Ref 13)



7.5.13 **Table 7.5** presents the local authorities within the Study Area by the average Index of Multiple Deprivation (IMD) score rank and the proportion of Lower layer Super Output Areas (LSOAs) in the most deprived 10% areas nationally (Ref 15).

7.5.14 North East Lincolnshire is the most deprived local authority by both metrics, ranking 29th out of 317 district-tier local authorities in England by average IMD score. In addition, almost one-third (30.2%) of LSOAs in North East Lincolnshire are within the 10% most deprived areas in England. East Lindsey is within the 20% most deprived local authorities in England, ranking 39th. In contrast, South Holland is the least deprived local authority within the Study Area and none of the LSOAs in South Holland are within the top 10% most deprived areas nationally. There are clusters of highly deprived LSOAs along coastal urban areas, and within the central areas of Boston and King's Lynn and West Norfolk.

Table 7.5 Local authorities within the Study Area by the average Index of Multiple Deprivation (IMD) score rank and the proportion of Lower layer Super Output Areas (LSOAs) (Ref 15)

Local Authority	IMD rank of average score	Proportion of LSOAs in most deprived 10% nationally
North East Lincolnshire	29	30.2%
East Lindsey	39	16.1%
West Lindsey	136	7.7%
Boston	102	2.8%
South Holland	168	0.0%
Fenland	80	7.3%
King's Lynn and West Norfolk	94	7.9%

Occupational group

7.5.15 Employment by major occupational group, by local authority in the Study Area as recorded in Census 2021 data, is displayed in **Table 7.6** and reveals the following trends. In North East Lincolnshire, Boston, Fenland and South Holland the highest proportion of occupations are process, plant and machine operatives whereas in West Lindsey, professional occupations represent the largest occupational group. Skilled trades occupation are the largest occupational group in East Lindsey. In King's Lynn and West Norfolk, the largest proportion of occupations are made up of skilled trades occupations and professional occupations. In the regions of, East Midlands, East of England and Yorkshire and the Humber, there is a higher proportion of skilled trades occupations compared to the national average of 10.2%, but a smaller proportion for professional occupations than the national average of 20.3%.

Table 7.6 Population in employment by major occupational group (Ref 13)

Major occupational group by Standard Occupational Classification (SOC) 2010	North East Lincolnshire	East Lindsey	West Lindsey	Boston	South Holland	Fenland	King's Lynn and West Norfolk	Yorkshire and the Humber	East Midlands	East of England	England
Total number employed	**68,851**	**55,579**	**42,137**	**33,631**	**45,236**	**47,108**	**69,223**	**2,461,368**	**2,272,324**	**3,028,641**	**26,405,214**
	%	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Managers, directors, and senior officials	8.8	13.1	13.6	8.5	11.5	10.7	12.0	11.2	12.0	13.7	12.9
Professional occupations	12.3	12.2	17.7	10.7	11.0	11.1	13.8	18.1	17.5	19.6	20.3
Associate professional and technical occupations	10.6	10.4	12.1	7.4	9.2	10.9	10.9	12.3	11.9	13.3	13.3
Administrative and secretarial occupations	8.5	8.5	9.2	7.6	9.0	8.7	8.9	9.0	9.1	9.8	9.3
Skilled trades occupations	11.8	14.5	12.6	11.0	13.2	13.1	14.0	11.1	10.8	10.7	10.2
Caring, leisure and other service occupations	10.7	11.9	10.3	10.1	9.1	10.5	10.9	9.7	9.5	9.1	9.3
Sales and customer service occupations	8.3	8.6	7.3	7.8	7.2	7.4	7.5	8.3	7.7	7.0	7.5
Process, plant, and machine operatives	15.1	8.5	7.9	18.6	15.4	14.0	10.0	8.4	8.9	6.9	6.9
Elementary occupations	13.9	12.3	9.3	18.3	14.3	13.4	12.1	11.8	12.6	9.9	10.5

7.5.16 Employment by broad industrial group based on data from the Business Register and Employment Survey (2023) is shown in **Table 7.7**. The data is based on Standard Industrial Classification (SIC) groups that classify businesses (and their employees) according to the type of their economic activity. The statistics are rounded which helps explain in some instances why the total sums in each group do not reach exactly 100%.

7.5.17 In all local authority areas, the four industries with the largest proportion of employment are the same, namely: Manufacturing (Sector C), Retail Trade (Sector Part G), Business administration and support services (Sector N), Education (Sector P) and Health (Sector Q). This is consistent with the top four employment industries for the Yorkshire and the Humber the East of England and the East Midlands, showing a regional concentration of employment in these industries. Nationally, the top three industries are Health (Sector Q) Professional, Scientific and Technical (Sector M) and Education (P).

7.5.18 In the Construction sector (F), both West Lindsey (8.1%) and King's Lynn and West Northfolk (6.3%) have a higher proportion of employment than their national comparators, Yorkshire and the Humber (5.9%), the East Midlands (4.4%) the East of England (6.2%) and England (4.8%) respectively. For the Boston, East Lindsey and South Holland areas, the Agriculture, forestry and fishing sector (A) represents the largest proportion of employment than all other selected geographies.

Table 7.7 Employment by broad industrial group (Ref 12)

Major occupational group by Standard Occupational Classification (SOC) 2010	North East Lincolnshire	East Lindsey	West Lindsey	Boston	South Holland	Fenland	King's Lynn and West Norfolk	Yorkshire and the Humber	East Midlands	East of England	England
Total number employed	**68,025**	**50,100**	**30,025**	**33,400**	**36,975**	**40,375**	**62,650**	**2,568,000**	**2,218,000**	**2,969,000**	**28,246,000**
	%	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**	**%**
Agriculture, forestry and fishing (A)	0.3	6.0	7.3	8.8	7.9	3.8	5.6	1.4	1.6	1.4	1.2
Mining, quarrying and utilities (B,D and E)	1.5	1.0	1.6	0.6	0.7	1.5	1.4	1.1	1.4	1.0	1.1
Manufacturing (C)	14.7	10.0	11.3	11.8	15.8	17.5	11.1	10.6	11.9	7.2	7.3
Construction (F)	4.4	4.5	8.1	3.7	5.3	5.6	6.3	4.9	4.4	6.2	4.8
Motor trades (Part G)	3.3	2.0	2.3	2.9	2.4	2.2	3.2	2.2	2.3	2.4	1.7
Wholesale (Part G)	3.3	4.0	4.0	5.1	10.5	5.0	3.2	4.0	4.8	4.1	3.8
Retail (Part G)	10.3	10.0	7.3	8.8	7.9	7.5	11.1	8.5	8.0	8.5	8.2

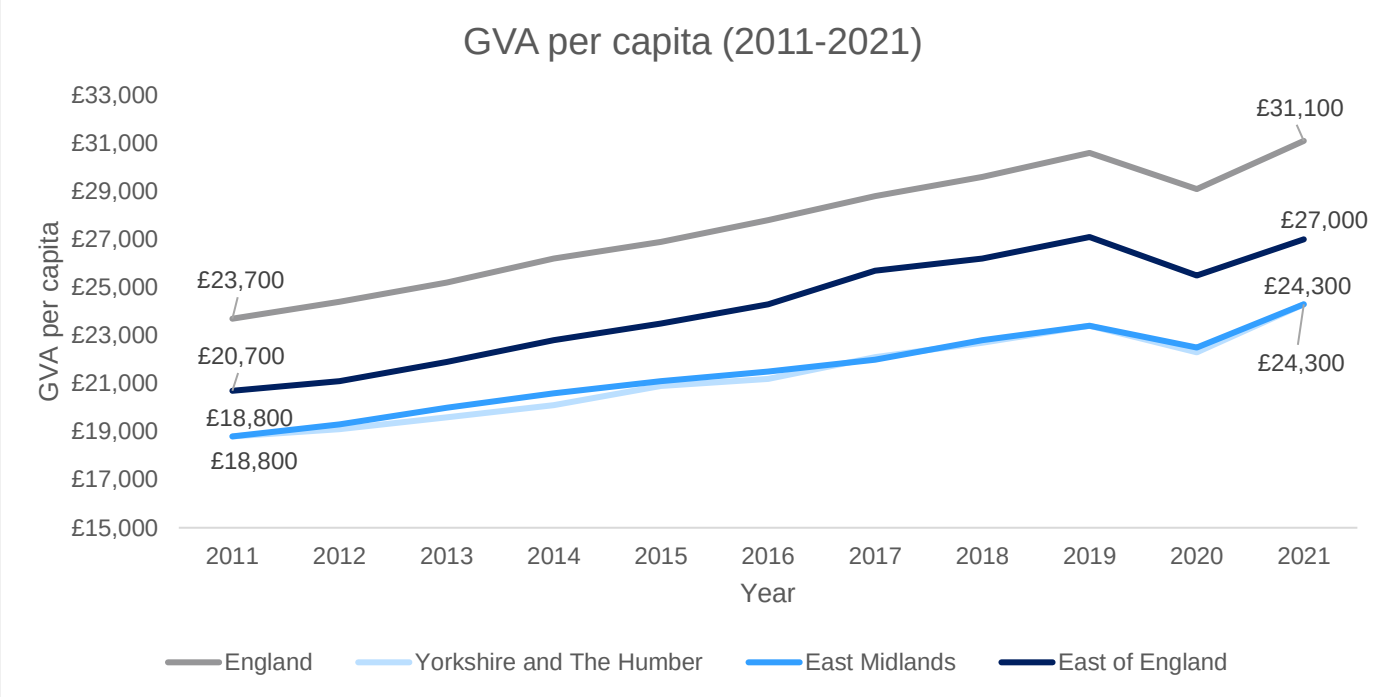
Major occupational group by Standard Occupational Classification (SOC) 2010	North East Lincolnshire	East Lindsey	West Lindsey	Boston	South Holland	Fenland	King's Lynn and West Norfolk	Yorkshire and the Humber	East Midlands	East of England	England
Transport and storage (inc. postal) (H)	8.8	3.5	2.9	5.1	9.2	7.5	4.0	5.8	6.9	6.0	5.1
Accommodation and food services (I)	7.4	20.0	5.6	4.4	4.6	4.4	9.5	7.6	7.0	7.2	7.8
Information and communication (J)	0.7	1.0	1.6	1.0	0.7	0.9	0.8	2.6	2.7	3.3	4.7
Financial and insurance (K)	0.9	0.4	0.6	0.6	0.6	0.4	2.4	2.8	1.4	2.0	3.4
Property (L)	1.2	1.8	4.8	1.5	0.9	1.5	2.0	1.6	1.9	2.3	2.1
Professional, scientific and technical (M)	5.1	3.5	5.6	2.4	3.9	4.4	4.0	7.1	7.3	8.6	9.7
Business administration and support services (N)	5.9	4.5	4.8	11.8	10.5	11.2	6.3	8.2	7.4	11.0	8.8
Public administration and defence (O)	2.2	2.0	5.6	2.1	1.2	3.1	2.8	4.7	3.9	3.4	4.2

Major occupational group by Standard Occupational Classification (SOC) 2010	North East Lincolnshire	East Lindsey	West Lindsey	Boston	South Holland	Fenland	King's Lynn and West Norfolk	Yorkshire and the Humber	East Midlands	East of England	England
Education (P)	8.8	8.0	9.7	7.4	5.3	11.2	7.1	9.2	8.7	8.6	8.3
Health (Q)	17.6	10.0	9.7	17.6	7.9	10.0	15.9	14.1	14.1	12.3	13.3
Arts, entertainment, recreation and other services (R,S,T and U)	3.7	8.0	4.0	2.6	2.1	3.1	2.8	3.7	4.2	4.5	4.6

Economy and employment

7.5.19 **Image 7.3** presents Gross Value Added (GVA) per head[3] in the regions within the Study Area (Yorkshire and the Humber, East Midlands and East of England) compared to the national average for 2011-2021 (Ref 8)[4]. As of 2021, GVA per head across all three regions is lower than the national average of £31,100. The East of England region has the highest GVA per head of the three regions, at £30,000, compared to £24,300 in the East Midlands and Yorkshire and the Humber. Notably, the East of England region is the only region within the area of study where GVA per head has not returned to pre-pandemic levels.

Image 7.3 GVA per capita, regional and national, 2011-2021 (Ref 8)



7.5.20 **Table 7.8** shows the geographical areas within the Study Area by economic activity and unemployment rate among the population aged 16 years and over (Ref 13)[5].

[3] GVA is a measure of economic productivity that quantifies how much a corporate subsidiary, company, or municipality contributes to the overall economy, a specific producer, sector or region.

[4] Analysing GVA at the regional level has been chosen over the LA level to reduce data volatility for a number of reasons, including alignment with functional economic areas and alignment with strategic economic policymaking. For example, estimates at the LA level can be highly volatile due to small sample sizes and sectoral specialisation, leading to unreliable year-on-year trends. Additionally, regional estimates better reflect functional economic areas, considering that commuting patterns and supply chains often extend beyond administrative boundaries, especially in more rural settings. Another reason includes aligning with strategic policymaking, as many economic policies and infrastructural investments are designed at regional level. In summary, this approach smooths out anomalies, captures cross-boundary economic activity, and provides a more balanced perspective, avoiding misleading comparisons based on administrative boundaries.

[5] The unemployment rate is the percentage of the labour force that is not currently employed but is actively seeking work. It is calculated by dividing the number of unemployed individuals by the total labour force. The economic activity rate, also known as the labour force participation rate, is the percentage of the population that is either employed or actively seeking employment. This metric includes both employed and unemployed individuals who are part of the workforce.

7.5.21 All local authorities within the Study Area, with the exception of Boston, have a lower economic activity rate than the England average of 58.6%. Boston has an economic activity rate of 59.7%, which is also higher than the regional average for East Midlands of 57.5%. East Lindsey has the lowest economic activity rate in the Study Area, at 47.6%, compared to the regional average for Yorkshire and the Humber of 56.2%, and the national average of 58.6% in England as a whole. One underlying factor for the general lower level of economic activity within the Study Area is that a higher proportion of the population is aged 65 and over and retired when compared to the England average.

7.5.22 All local authorities and regions within the Study Area have a lower unemployment rate than the England average (2.9%). North East Lincolnshire has the highest unemployment rate among the local authorities at 2.8% and King's Lynn and West Norfolk has the lowest at 2.1%.

Table 7.8 Geographical areas by economic activity and unemployment rate (Ref 13)

Geographical area	Economic activity rate	Unemployment rate
Local authorities		
North East Lincolnshire	55.4%	2.8%
East Lindsey	47.6%	2.7%
West Lindsey	54.4%	2.2%
Boston	59.7%	2.5%
South Holland	58.5%	2.2%
Fenland	57.0%	2.4%
King's Lynn and West Norfolk	55.0%	2.1%
Regions		
Yorkshire and the Humber	56.2%	2.7%
East Midlands	57.5%	2.4%
East of England	59.8%	2.5%
National		
England	58.6%	2.9%

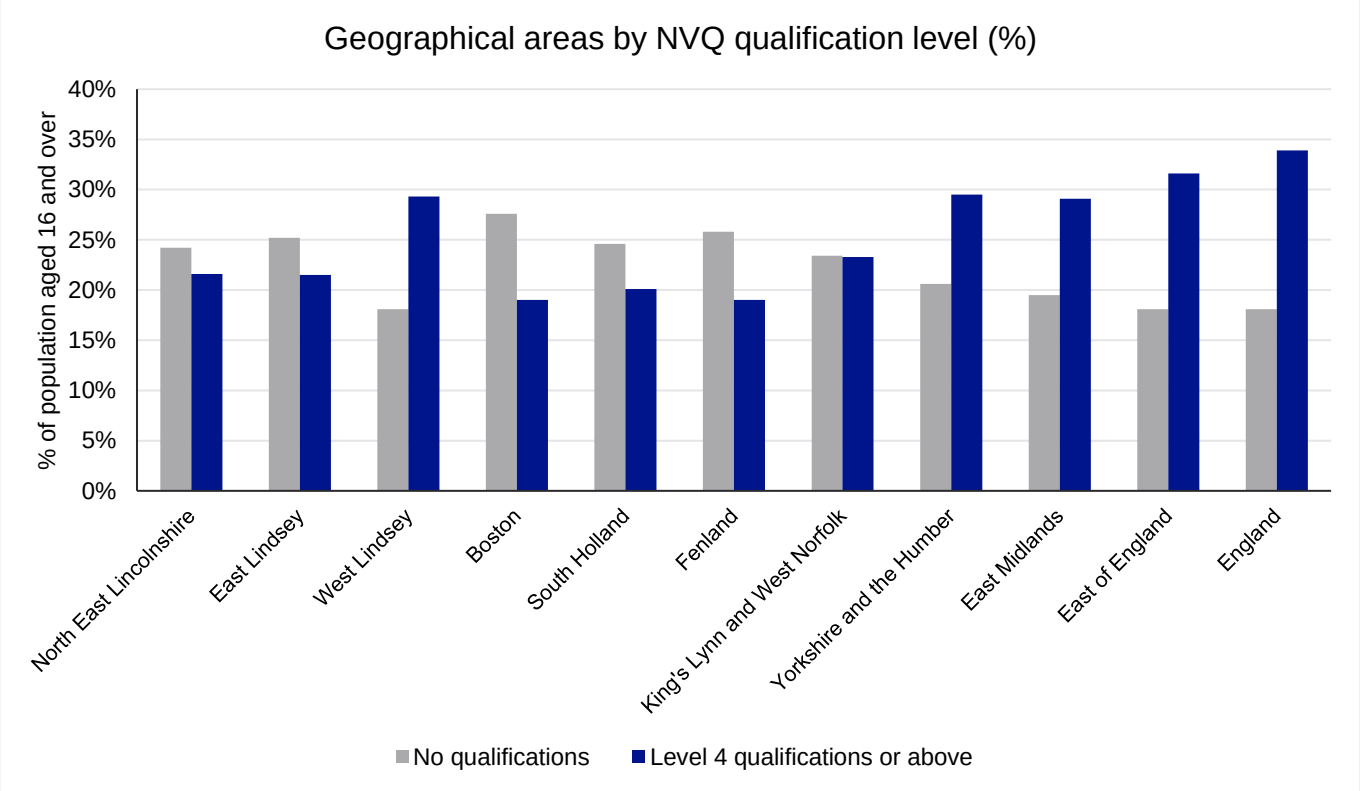
7.5.23 **Image 7.4** shows the geographical areas within the Study Area by percentage of the population aged 16 years and over with a degree-level qualification (National Vocational Qualification (NVQ) Level 4) and population with no qualifications. All local authorities within the Study Area have a lower proportion of the population aged 16 and over with a degree-level qualification compared to the England average of 33.9%. West Lindsey records the highest proportion of the population with a degree-level qualification or higher at 29.3%, and Boston and Fenland record the lowest, both at 19%.

7.5.24 All regions within the Study Area also record a lower proportion of the population with a degree-level qualification or above compared to the England average of 33.9%. The East of England records the highest proportion at 31.6%, followed by Yorkshire and the Humber at 29.5% and East Midlands at 29.1%.

7.5.25 All local authorities within the Study Area also record a higher proportion of the population with no qualifications (Entry Level through to Level 3) compared to the England average of 18.1%. Boston is the local authority within the Study Area with the highest proportion of the population with no qualifications at 27.6%, followed by Fenland and East Lindsey at 25.8% and 25.2% respectively.

7.5.26 Regionally, Yorkshire and the Humber and the East Midlands record a higher proportion of the population without qualifications compared to the England average at 20.6% and 19.5% respectively. The East of England region is in line with the England average at 18.1%.

Image 7.4 Geographical areas by proportion of the population with an NVQ of level 4 (degree-level) or above and with no qualifications (Ref 13)



7.5.27 At the local authority level, manufacturing accounts for the largest sector of employment in South Holland, at 17.9% as a proportion of total employment (%), with comparable figures of 16.2% in Fenland and 12.5% in West Lindsey (Ref 13). In contrast, of all the local authorities within the Study Area, health accounts for the largest sector of employment in Boston, at 18.8%, with 18.2% in North East Lincolnshire and 16.7% in King's Lynn and West Norfolk. Accommodation and food services account for the largest sector of employment in East Lindsey and employs 19.6% of the workforce.

7.5.28 At the regional and England levels, the health sector is the largest employer. It is noted that the analysis presented here is at local authority level.

Tourism and strategic visitor attractions

7.5.29 The Greater Lincolnshire Local Enterprise Partnership (LEP) identifies the visitor economy as a priority sector and tourism is estimated to contribute £2.39 billion per annum to the Greater Lincolnshire economy and supports 30,000 full-time equivalent (FTEs) jobs across the region (Ref 9). Recent developments and key projects in the region include a series of investments on the coastline and in the Lincolnshire Wolds National Landscape (Area of Outstanding Natural Beauty (AONB)) aimed at enhancing the quality of the visitor experience. These include the opening of the £2 million North Sea Observatory at Chapel St Leonards, near Skegness, and the delivery of cultural and tourism projects in Alford and Spilsby through £8 million in Levelling Up funding awarded to East Lindsey Council, which comprise heritage assets under regeneration (Ref 7). Gibraltar Point Nature Reserve together with the Humber Estuary, have also been added to the UK's tentative list for the United Nations Educational, Scientific and Cultural Organization World Heritage status.

Employment within the tourism sector

7.5.30 **Table 7.9** shows the geographical areas within the Study Area by employment in the tourism and hospitality industries, which is composed of employment in accommodation, food and beverage services and travel and tour agency related activities. The tourism and hospitality sector in East Lindsey accounts for 18.6% of employment, which is higher than the regional average for the East Midlands at 7.6%, and the England average of 8.2% (Ref 12). Tourism also accounts for a significant proportion of employment in King's Lynn and West Norfolk at 10.9%. At the regional level, all three regions have slightly lower employment in the tourism industry compared to the England average. This is compared to the England value of 2,213,000 people employed in the tourism industry, which equates to 8.2% employment within this sector

7.5.31 **Table 7.9** shows the number and proportion of jobs in the tourism sector by local authority, compared the England data, combining both full-time and part-time jobs. The tourism sector supports approximately 8,550 jobs in East Lindsey, where the sector also accounts for the highest proportion of employment of all sectors at 18.6%. This figure is followed by King's Lynn and West Norfolk where the tourism sector supports 6,550 jobs, and followed by North East Lincolnshire where the tourism sector supports 5,075 jobs. The tourism sector supports the lowest number of jobs in Boston, supporting 1,515 jobs, South Holland, supporting 1,885 jobs, and West Lindsey supporting 1,950 jobs. This is compared to the England value of 2,213,000 people employed in the tourism industry, which equates to 8.2% employment within this sector.

Table 7.9 Geographical areas by employment in the tourism industry: absolute employment and as a proportion of total employment (Ref 12)

Geographical area	Total employment in the tourism industry	Employment in the tourism industry (% of total employment)
Local authorities		
North East Lincolnshire	5,075	7.7%
East Lindsey	8,550	18.6%

Geographical area	Total employment in the tourism industry	Employment in the tourism industry (% of total employment)
West Lindsey	1,950	6.9%
Boston	1.515	4.7%
South Holland	1,885	4.9%
Fenland	2,145	5.8%
King's Lynn and West Norfolk	6,550	10.9%
Regions		
Yorkshire and the Humber	185,000	7.5%
East Midlands	164,500	7.6%
East of England	228,000	8.1%
National		
England	2,213,000	8.2%

Economic contribution of day and overnight visitors

7.5.32 **Table 7.10** shows the value of tourism in each local authority and region within the Study Area. Among the local authorities, East Lindsey receives the highest number of day and overnight visitors, contributing £217 million (through day visitors) and £284 million (though overnight visitors) to the economy respectively; this is compared to England's tourism sector, which contributes £106 billion to the British economy (GDP) when its direct and indirect impacts are taken into account (Ref 14). In contrast, the tourism industry contributes less to the economies of Boston and Fenland, which receive the lowest number of visitors, and the lowest tourist spend.

Table 7.10 Geographical areas within the Study Area by volume of day and overnight visits and total spend (Ref 9)

Geographical area	Day visits volume, annual average *(millions of people)*	Day visits spend, annual average *(millions £)*	Overnight trips, annual average *(millions of people)*	Overnight spend, annual average *(millions £)*
Local authorities				
North East Lincolnshire	1.58	£75	0.23	£46
East Lindsey	4.31	£217	1.06	£284
West Lindsey	0.71	£27	0.10	£9
Boston	0.54	£9	0.08	£6

Geographical area	Day visits volume, annual average *(millions of people)*	Day visits spend, annual average *(millions £)*	Overnight trips, annual average *(millions of people)*	Overnight spend, annual average *(millions £)*
South Holland	0.66	£9	0.09	£23
Fenland	0.44	£8	0.04	£3
King's Lynn and West Norfolk	3.47	£83	0.34	£82
Regions				
Yorkshire and the Humber	49.45	£2,280	6.01	£1,382
East Midlands	66.91	£2,423	7.85	£1,696
East of England	94.20	£2,928	9.39	£1,979

Strategic visitor attractions

7.5.33 **Table 7.11** shows strategic visitor attractions identified within 5 km of the Study Area using data from the Visit Britain Annual Attractions Survey 2023 report (Ref 6), local business websites (Ref 3) and news articles (Ref 31). Strategic visitor attractions identified are located within the authorities of East Lindsey and Lincolnshire and are depicted on **PEI Report Volume 2 Part C Figure 7.1 Route-wide Assessment Receptors within Study Area**. For the purposes of the baseline study, strategic visitor attractions are defined as tourism attractions that are considered to be of importance to the economy, and, where data is available, record around 50,000 visitors per year (which represents a reasonable number to represent an attraction that could be considered to be of regional importance).

7.5.34 Five of the strategic visitor attractions identified in the baseline study are located in Skegness, showing the importance of the tourism sector for the economy in this town. All of the strategic visitor attractions identified in **Table 7.11** are assessed as having high sensitivity (as defined within **PEI Report Volume 3 Part A Appendix 4B EIA Assessment Methodologies and Scope**), due to their unique tourism offer, quantum of visitor numbers and subsequent value to the region and as such, their limited availability for substitution.

7.5.35 It should be noted that for each strategic visitor attraction, visitor data from the same year could not be obtained due to limitations in the availability of data in the public domain, and therefore the most recent and relevant data available for each receptor is presented below. In some instances, no published data is available for the tourism receptor at the time of writing, however, these attractions are included as on a precautionary basis given they are publicised on the 'Visit Lincolnshire'[6] website and therefore may be considered to be of regional importance.

[6] Visit Lincolnshire (2025). Available at: Visit Lincolnshire | Inspire your Next Trip to City, Countryside or Coast [accessed 26 March 2025].

Table 7.11 Strategic visitor attractions within 5 km of the Scoping Boundary (Ref 3, Ref 6 and Ref 31)

Tourism receptor	Location	Category	Visitor numbers	Sensitivity of receptor
Ark Wildlife and Dinosaur Park	Stickney	Zoos and aquariums	Unknown	High
Fantasy Island Theme Park	Skegness	Amusement parks	3,000,000 (per year) (2024)	High
Lincolnshire Wildlife Park	Friskney	Zoos and aquariums	73,469 (per year) (2023)	High
Skegness Aquarium	Skegness	Zoos and aquariums	Unknown	High
Skegness Natureland Seal Sanctuary	Skegness	Zoos and aquariums	103,258 (per year) (2023)	High
Skegness Pleasure Beach	Skegness	Amusement parks	600,000 (per year) (2018)	High
North Sea Observatory at Chapel St Leonards	Chapel St Leonards	Nature reserve/wildlife attraction	Unknown	High
Gibraltar Point Nature Reserve	Skegness	Nature reserve/wildlife attraction	Unknown	High
Gunby Hall and Gardens	Spilsby	Heritage	43,700 (per year) (2023)	High

Tourism bedspaces

7.5.36 **Table 7.12** summarises the number of bedspaces available by accommodation type and geographical area according to the 2016 Visit Britain Survey of Accommodation Stock (Ref 22). Serviced accommodation includes hotels and similar establishments, such as bed and breakfasts (B&Bs), and non-serviced accommodation includes holiday lets, caravan parks and tourist campsites and other collective accommodation. In total, there are 40,074 bedspaces among the local authorities within the Study Area. East Lindsey has the highest total of serviced and non-serviced bedspaces, with a proportion of these bedspaces made up of caravan parks and tourist camping site accommodation, which are more seasonal in nature. Occupancy data from the Visit Britain survey (Ref 30) indicates a hotel occupancy rate of 82% as an average across the East Midlands, East of England, and Yorkshire and Humberside over the peak tourist season months (July and August) which provides a helpful proxy for capacity. Assuming this holds for bedspaces across the Study Area, this indicates there could be at least 7,213 spare beds a month over the peak tourist season (Ref 30).

Table 7.12 Number of tourism bedspaces available by accommodation type and geographical area (Ref 22)

Geographical area	Serviced accommodation	Non-serviced accommodation	Total serviced and non-serviced
Local Authorities			
North East Lincolnshire	2,379	3,335	5,714
East Lindsey	5,563	17,348	22,911
West Lindsey	473	981	1,454
Boston	1,002	405	1,407
South Holland	882	484	1,366
Fenland	505	159	664
King's Lynn and West Norfolk	2,501	4,557	7,058
Regions			
Yorkshire and the Humber	127,223	114,723	241,946
East Midlands	96,115	82,417	178,532
East of England	111,885	73,596	185,481
National			
England	1,768,795	1,401,716	3,170,511

Future Baseline

7.5.37 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including: those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.

7.5.38 At this preliminary stage, a full assessment of the implications of any committed developments with respect to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within P**EI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information Annex I Developments for Consideration Within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.

Affected communities

7.5.39 The future baseline of the affected communities is limited within this report to inclusion of the latest available population projections data, as planning policy which might affect the future growth of the affected communities is addressed within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy** and **PEI Report Volume 3 Part A Appendix 2Cii Local Planning Policy: Route-Wide**. Strategic development land allocations (where adopted) within the Study Area are considered within **PEI Report Volume 2 Part B Sections 1-7 Chapter 11 Socio-economics, Recreation and Tourism**.

7.5.40 The growth rate of the working age population is projected to vary considerably by local authority, as shown within **Table 7.13**. The population of Boston aged between 16 and 64 is projected to increase by 14.5% between 2018 and 2043, followed by 10.7% in South Holland and 9.9% in Fenland for the same age bracket (Ref 19). In contrast, the working age population is expected to decrease in local authorities North East Lincolnshire, West Lindsey, and King's Lynn and West Norfolk within this period.

7.5.41 At the regional level, the working age population in the East Midlands is expected to increase by 7.3% between 2018 and 2043. The East of England and Yorkshire and the Humber are projected to register an increase 3.3% and 1.4% respectively. In England as a whole, the population of working age is expected to increase by 3.8% from 2018 to 2043. Reflecting the regional and national (England) trend, all local authorities within the Study Area are projected to experience an increase in the population aged 65 and over by 2043. In East Lindsey, the population aged 65 and over is projected to increase by 45.9% between 2018 and 2043, which is the highest amongst the local authorities within the Study Area. In contrast, the population aged 65 and over in King's Lynn and West Norfolk is expected to increase by 34.3% from 2018 to 2043, which is lower than the regional and England averages.

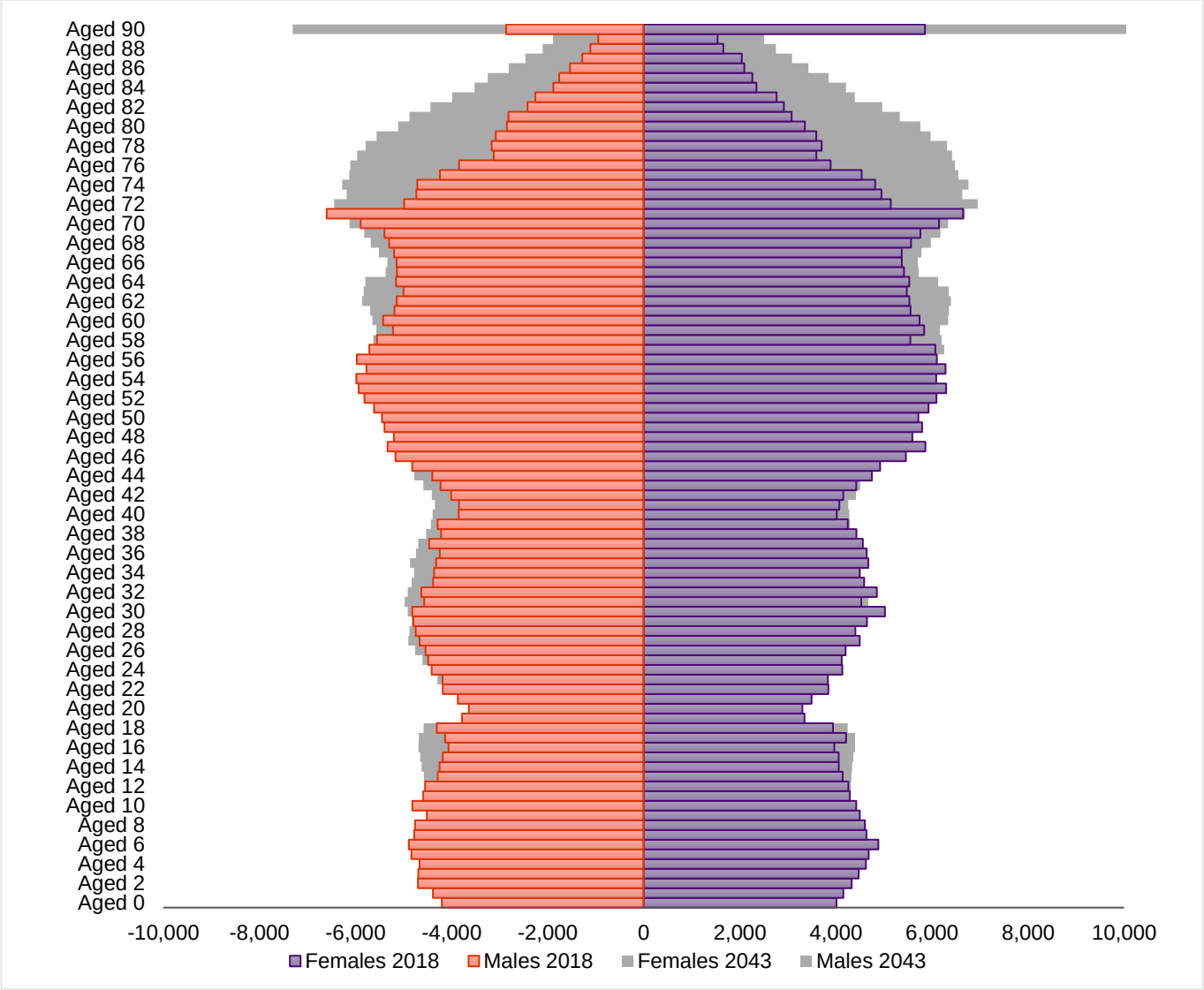
Table 7.13 Geographical areas within the Study Area by projected population change from 2018 to 2043 – total and by age group (Ref 19)

Geographical area	% Change, ages 0-15	% Change, ages 16-64	% Change, ages 65+	% Change, total
Local authorities				
North East Lincolnshire	-13.3%	-8.7%	35.8%	-0.6%
East Lindsey	-1.7%	2.7%	45.9%	14.9%
West Lindsey	-4.0%	-1.4%	41.0%	8.5%
Boston	9.2%	14.5%	41.5%	19.1%
South Holland	7.3%	10.7%	40.7%	17.3%
Fenland	5.6%	9.9%	45.5%	17.2%
King's Lynn and West Norfolk	-6.7%	-3.8%	34.3%	5.5%
Regions				

Geographical area	% Change, ages 0-15	% Change, ages 16-64	% Change, ages 65+	% Change, total
Yorkshire and the Humber	-1.5%	1.4%	37.4%	7.5%
East Midlands	4.4%	7.3%	46.3%	14.3%
East of England	-1.3%	3.3%	43.4%	10.3%
National				
England	-0.9%	3.8%	44.7%	10.3%

7.5.42 **Image 7.5** shows a population pyramid of the total population in the local authorities within the Study Area in 2018, with the grey bars representing an increase in population between 2018 and 2043. The significant widening of the top of the pyramid reflects an ageing population, with an increasing proportion of the population in the area aged 65 and over.

Image 7.5 Population pyramid of the local authorities within the Study Area from 2018 to 2043 (Ref 19)



The labour market

7.5.43 The future baseline for the labour market over the medium to longer-term is uncertain beyond where allocated and planned development sites have been identified. Due to this uncertainty, it is assumed the future baseline for the Study Area for the labour market would be unchanged from the current baseline to the completion of the Project, except where new development is expected to be delivered in line with allocated and planned development sites as set out within the **PEI Report Volume 2 Part B Sections 1-7 Chapter 11 Socio-economics, Recreation and Tourism**.

7.5.44 **Table 7.14** shows FTE employment estimates in terms of jobs supported for each year of construction of the Project nationally, and also within the regions identified in the Study Area. These estimates are based on National Grid cost estimates which will be updated as the Project matures. To estimate jobs supported, a construction labour coefficient estimates for infrastructure projects from the HCA's Calculating Cost Per Job Best Practice Note is used (Ref 23).

7.5.45 To account for additionality, a leakage adjustment has been used and displacement/substitution adjustment multipliers from HCA Additionality Guide (Ref

25). These are used to estimate gross and net direct, indirect and induced effects, nationally and regionally.

7.5.46 The 'National Gross Effect' refers to the overall employment impact of the Project across England. The 'Regional Gross Effect' refers to the overall employment impact of the Project within the regions of the Study Area after adjusting for leakage effects (i.e. how some jobs will fall outside of the regions of the Study Area). The 'Regional Net Effect' refers to the overall economic impact of the Project within the regions of the Study Area after accounting for leakage and displacement or substitution effects (i.e. to understand how many jobs will be additional). All of these effects include direct, indirect and induced sub totals, which account for the number of jobs supported directly from firms responsible for the construction of the Project (direct), the number of jobs supported from the supply chain which supports the construction of the Project (indirect) and the number of jobs supported by the additional personal spending from the direct and indirect jobs.

7.5.47 Nationally, the Project is expected to support approximately 2,245 jobs in each of the 5 construction years on average, and of this, regionally, the Project is expected to support approximately 2,020 jobs as a regional total gross effects. After accounting for leakage, the Project is expected to support approximately 1,616 jobs as a regional total net effect.

Table 7.14 FTE (full-time equivalent) employment estimates in terms of jobs supported for each year of construction

Employment effect	2029	2030	2031	2032	2033	Average
National Total Gross Effect	**2,594**	**3,898**	**4,608**	**3,566**	**1,046**	**2,245**
Direct Effect	1,459	2,193	2,592	2,006	589	1,263
Indirect Effect	820	1232	1456	1127	331	709
Induced Effect	315	473	559	433	127	272
Regional Total Gross Effect	**2,334**	**3,509**	**4,147**	**3,210**	**942**	**2,020**
Direct Effect	1,313	1,974	2,333	1,805	530	1,136
Indirect Effect	738	1,109	1,311	1,014	298	639
Induced Effect	283	426	503	390	114	245
Regional Total Net Effect	**1,868**	**2,807**	**3,317**	**2,568**	**753**	**1,616**
Direct Effect	1,051	1,579	1,866	1,444	424	909
Indirect Effect	590	887	1,049	812	238	511
Induced Effect	227	341	403	312	91	196

Visitor accommodation bedspace

7.5.48 The future baseline for tourism bedspace over the medium to longer-term is uncertain beyond where allocated and planned development sites have been identified. Due to this uncertainty, it is assumed the future baseline for the Study Area for tourism bedspace would be unchanged from the current baseline to the completion of the Project, except where new development is expected to be delivered in line with allocated and planned development sites as set out above.

Strategic visitor attractions

7.5.49 The future baseline for strategic visitor attractions over the medium to longer-term is uncertain beyond where allocated and planned development sites have been identified. Due to this uncertainty, it is assumed the future baseline for the Study Area for strategic visitor attractions would be unchanged from the current baseline to the completion of the Project, except where new development is expected to be delivered in line with allocated and planned development sites.

7.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

7.6.1 The Project and draft Order Limits and Refined Siting Zone have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 28) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 29) which apply to design and siting of substations. These approaches are explained in further detail within the **Corridor Preliminary Routeing and Siting Study (CPRSS)** (Ref 32) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.

7.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works route-wide. This has further contributed to the avoidance or reduction of the potential environmental impacts of the Project.

7.6.3 No specific design mitigation measures are identified for Socio-economic, Recreation and Tourism at this stage.

Control Mitigation Measures

7.6.4 A Preliminary Code of Construction (CoCP) is provided in **PEI Report Volume 3 Appendix 5A Preliminary Code of Construction Practice**. The control measures included within the Preliminary CoCP relevant to the route-wide Socio-economics, recreation and tourism assessment include:

i. NV02 - Best Practicable Means measures, as defined by The Control of Pollution Act 1974 and detailed in BS 5228-1:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites – Part 1: Noise, and Part 2: Vibration, will be identified within the CoCP and may include consideration of construction plant and methods, siting semi-static equipment as far as

reasonably practicable away from sensitive areas, screening, enclosures, and temporal restrictions.

ii. GG11 - Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.

iii. GG03 - Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced EnvCoW(s) will be available during the construction phase to advise, supervise and report on the delivery of the mitigation methods and controls outlined in the Management Plans. The EnvCoW(s) will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The EnvCoW(s) will be supported as necessary by appropriate specialists, including ecologists and arboriculturists, soils and land drainage experts.

iv. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management Plan (MWMP) and a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Strategy (PRoWMP) Overarching Written Scheme of Investigation (oWSI), Biodiversity Management Plan, Noise and Vibration Management Plan, Pollution Prevention Plan, Foundation Works Risk Assessment, Carbon efficiency Plan, Dust Management Plan (DMP), Drainage Management Plan (DrMP), along with a Soil Management Plan (SMP) will be produced prior to construction. These are collectively referred to as 'the environmental control Plans.'

v. GG07: The CEMP will set out site specific measures and construction methodologies to avoid or reduce potential effects of the Project on the environment during construction. The contractor(s) shall undertake regular site inspections to check conformance to the Management Plans.

Additional Mitigation Measures

7.6.5 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.

7.6.6 Additional mitigation measures are not anticipated to be required in relation to Socio-economics, recreation and tourism effects. However, this will remain under review during the completion of further assessment and development of the ES.

7.7 Preliminary Assessment of Effects

7.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Study Area, as a result of construction activities within the Project.

7.7.2 The preliminary assessment of effects reported below takes into account the Design and Control measures reported above.

7.7.3 A supplementary summary of all non-significant effects is also included within this section in **Table 7.15**, based upon the assessment scope detailed in **PEI Report**

Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope.

7.7.4 It should be noted that this is an ongoing assessment and is subject to changes due to the ongoing development of the Project, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application.

Likely Significant Effects

Construction

7.7.5 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. Further discussion is provided in the following sections in relation to the predicted non-significant effects of the Project.

Likely Non-Significant Effects

Construction

Affected communities

7.7.6 The Project has been designed to avoid direct effects on affected communities. However, there is the potential for indirect temporary effects to arise from construction activities.

7.7.7 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, substations and associated works. This may cause access, dust, noise and vibration effects as considered in other topic chapters in **PEI Report Volume 2 Part B** (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 Chapter 10 Health and Wellbeing**. Whilst this assessment seeks to avoid duplicating the reporting of any significant effects identified in those other topic assessments, it is acknowledged that in-combination, the environmental conditions and character of communities may be temporarily affected by construction activities for the Project. At ES stage, an assessment will be undertaken informed by the completed assessments of the topics referenced above, considering where there may be more than one reported significant effect that could impact on a local population. At this stage it is anticipated that effects associated with construction activities would generally be minor adverse and temporary. Typically, effects would be felt most by communities in closest proximity to the Project.

7.7.8 Indirect effects including those relating to amenity will be monitored and managed through the CEMP, CTMP and appropriate management will reduce the potential for significant effects. Traffic management would help reduce impacts upon affected communities by restricting construction traffic to certain routes and nuisance can generally be limited through considerate construction management practices. Further proposed mitigation is detailed in the Preliminary CoCP is provided in **PEI Report Volume 3 Appendix 5A Preliminary Code of Construction Practice**.

The labour market

7.7.9 Detail relating to the number of construction workers is evolving and further details will be provided at ES stage should National Grid have updated capital expenditure profiles and more information about the likely construction workforce at that stage. However, based on preliminary information, as per **Table 7.13**, 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.

7.7.10 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.

7.7.11 During the construction of the Project, non-local workers would require accommodation in the local area. Accommodation demand is likely to be serviced from hotels and similar establishments such as B&Bs, and non-serviced accommodation including holiday lets, caravan parks and tourist campsites, and other collective accommodation. Occupancy data from the Visit Britain survey indicates a hotel occupancy rate of 82% across the East Midlands, East of England, and Yorkshire and Humberside over the peak tourist season months (July and August (Ref 22)). Assuming this holds for the Study Area and applying a 18% spare capacity rate to the baseline information indicates that there could potentially be over 7,213 spare bedspaces within the Study Area over the peak months, which indicates that the accommodation stock should be able to accommodate the regional annual total net employment effect anticipated during construction of the Project without displacing bedspace for tourist requirements. Whilst there is potential for a minor adverse and temporary effect upon tourism bedspace, this impact is likely to be negligible given the net employment anticipated through construction of the Project.

7.7.12 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

7.7.13 In relation to the strategic visitor attractions set out in **Table 7.11**, 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 Refined Siting Zone) and on the basis that access to these attractions would be maintained at all times. **Table 7.15** summarises the findings of the preliminary assessment upon such receptors.

7.7.14 The access and amenity effects on strategic visitor attractions arising from the Project will predominantly be experienced during the construction phase. Effects

during operation and maintenance activities will be limited by virtue of their distant proximity from the Project, meaning negligible impacts are anticipated that are not considered to be significant.

7.8 Monitoring

7.8.1 Monitoring requirements to reduce or eliminate impacts on Socio-economics, recreation and tourism will be set out and secured in the CEMP and CTMP that will be produced prior to construction of the Project to accompany the DCO application.

7.8.2 No other monitoring specific to potential Socioeconomic, recreation and tourism impacts is currently proposed.

Table 7.15 Preliminary summary of Non-Significant effects

Receptor	Impact	Sensitivity	Magnitude of Change	Significance	Rationale
Affected communities	Potential for indirect temporary effects upon affected communities to arise from construction activities that may give rise to significant in-combination effects in connection with noise/vibration, air quality/dust, transport and movement (i.e. access) and visual impacts.	High	Small, adverse	Minor adverse, not significant	At ES stage, an assessment will be undertaken informed by the completed assessments of the other relevant EIA topics, considering where there may be more than one reported significant effect that could impact on a local population. At this stage it is anticipated that effects associated with construction activities would generally be minor adverse and temporary. Typically, effects would be felt most by communities in closest proximity to the Project.
Labour market	Potential for additional employment, training and apprenticeship opportunities generated through construction of the Project and its supply chain.	Medium	Small, positive	Minor positive, not significant	Construction of the Project will create employment, training and apprenticeship opportunities, both directly as a result of the construction of the project and indirectly through its supply chain.
Ark Wildlife and Dinosaur Park	At its closest point, this receptor is located approximately 3 km from the draft Order Limits and users may be affected by slight noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a High sensitivity. It is anticipated that there would be a Minor change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which would limit

Receptor	Impact	Sensitivity	Magnitude of Change	Significance	Rationale
	visual impacts during construction of the Project. No impact is anticipated during operation.				any indirect amenity effects, and it is assumed that access would be maintained at all times. Therefore, the anticipated effect is minor and not significant.
Fantasy Island Theme Park	At its closest point, this receptor is located approximately 4 km from the draft Order Limits and users may be affected by minor noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and visual impacts during construction of the Project. No impact is anticipated during operation.	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a High sensitivity. It is anticipated that there would be a Minor change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which would limit any indirect amenity effects, and it is assumed that access would be maintained at all times. Therefore, the anticipated effect is minor and not significant.
Lincolnshire Wildlife Park	At its closest point, this receptor is located approximately 2 km from the draft Order Limits and users may be affected by minor noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and visual impacts during construction of the Project. No impact is anticipated during operation.	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a High sensitivity. It is anticipated that there would be a Minor change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which would limit any indirect amenity effects, and it is assumed that access would be maintained at all times. Therefore, the

Receptor	Impact	Sensitivity	Magnitude of Change	Significance	Rationale
					anticipated effect is minor and not significant.
Skegness Aquarium	At its closest point, this receptor is located approximately 4 km from the draft Order Limits and users may be affected by minor noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and visual impacts during construction of the Project. No impact is anticipated during operation.	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a High sensitivity. It is anticipated that there would be a Minor change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which would limit any indirect amenity effects, and it is assumed that access would be maintained at all times. Therefore, the anticipated effect is minor and not significant.
Skegness Natureland Seal Sanctuary	At its closest point, this receptor is located approximately 4 km from the draft Order Limits and users may be affected by minor noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and visual impacts during construction of the Project. No impact is anticipated during operation.	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a High sensitivity. It is anticipated that there would be a Minor change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which would limit any indirect amenity effects, and it is assumed that access would be maintained at all times. Therefore, the anticipated effect is minor and not significant.

Receptor	Impact	Sensitivity	Magnitude of Change	Significance	Rationale
Skegness Pleasure Beach	At its closest point, this receptor is located approximately 4 km from the draft Order Limits and users may be affected by minor noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and visual impacts during construction of the Project. No impact is anticipated during operation.	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a High sensitivity. It is anticipated that there would be a Minor change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which would limit any indirect amenity effects, and it is assumed that access would be maintained at all times. Therefore, the anticipated effect is minor and not significant.
North Sea Observatory at Chapel St Leonards	At its closest point, this receptor is located approximately 4.5 km from the draft Order Limits and users may be affected by minor noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and visual impacts during construction of the Project. No impact is anticipated during operation.	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a High sensitivity. It is anticipated that there would be a Minor change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which would limit any indirect amenity effects, and it is assumed that access would be maintained at all times. Therefore, the anticipated effect is minor and not significant.
Gibraltar Point Nature Reserve	At its closest point, this receptor is located approximately 4.5 km from	High	Small, adverse	Minor adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and

Receptor	Impact	Sensitivity	Magnitude of Change	Significance	Rationale
	the draft Order Limits and users may be affected by minor noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and visual impacts during construction of the Project. No impact is anticipated during operation.				scale, this receptor has a High sensitivity. It is anticipated that there would be a Minor change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which would limit any indirect amenity effects, and it is assumed that access would be maintained at all times. Therefore, the anticipated effect is minor and not significant.
Gunby Hall and Gardens	At its closest point, this receptor is located approximately 500 m from the draft Order Limits and users may be affected by minor noise/vibration, air quality/dust, transport and movement (i.e. access to the visitor attraction) and visual impacts during construction of the Project. No impact is anticipated during operation.	High	Medium, adverse	Moderate adverse, not significant	Owing to its limited potential for substitution by virtue of its nature and scale, this receptor has a High sensitivity. It is anticipated that there would be a Moderate and temporary change due to the distant proximity of the receptor from the construction activities in the surrounding areas, which may create indirect amenity effects. It is assumed that access would be maintained at all times. Therefore, the anticipated effect is moderate and not significant.

References

Ref 1 National Grid Electricity Transmission (2024). Grimsby to Walpole Environmental Impact Assessment Scoping Report [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000004-EN020036%20-%20Scoping%20Report%20Volume%201%20Main%20Report.pdf [Accessed 8 January 2025].

Ref 2 BBC News, 2024. Gibraltar Point and Humber: World Heritage Status Forms Submitted [online]. Available at: https://www.bbc.co.uk/news/uk-england-lincolnshire-68833467#:~:text=Gibraltar%20Point%20and%20Humber%3A%20World%20Heritage%20Status%20forms%20submitted,-Published&text=Two%20wetland%20areas%20in%20Lincolnshire,to%20the%20UK's%20tentative%20list. [Accessed 12 July 2024].

Ref 3 Mellors Group, 2024. Mellors Group Fantasy Island Key Facts. Available at: https://mellorsgroup.com/our-brands/fantasy-island [Accessed 11 March 2025]

Ref 4 ONS, 2024. Estimates of the population for the UK, England, Wales, Scotland, and Northern Ireland [online]. Available at: https://www.ons.gov.uk/ [Accessed 12 July 2024].

Ref 5 The Planning Inspectorate, 2024. Scoping Opinion: Proposed Grimsby to Walpole Project [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000109-Scoping%20Opinion%202017%20EIA%20Regs.pdf [Accessed 8 January 2025].

Ref 6 Visit Britain, 2024. UK Tourism Industry Statistics and Research [online]. Available at: England UK Tourism Industry Stats & Data | VisitBritain.org [Accessed 11 March 2025].

Ref 7 Department for Levelling Up, Housing and Communities, 2023. East Lindsey receives over £8 million for its heritage assets (Levelling Up Fund 2) [online]. Available at: https://www.gov.uk/government/case-studies/east-lindsey-receives-over-8-million-for-its-heritage-assets-levelling-up-fund-2 [Accessed 12 July 2024]

Ref 8 ONS, 2023. Regional gross value added (balanced) by industry: all ITL regions [online]. Available at: https://www.ons.gov.uk/ [Accessed 12 July 2024].

Ref 9 West Lindsey District Council, 2023. Central Lincolnshire Local Plan [online]. Available at: https://www.west-lindsey.gov.uk/planning-building-control/planning/planning-policy/central-lincolnshire-local-plan-2023 [Accessed 8 January 202523 September 2024].

Ref 10 Fenland District Council, 2022. Emerging Local Plan. [online] Available at: https://www.fenland.gov.uk/newlocalplan [Accessed 25 September 2025].

Ref 11 Greater Lincolnshire Local Enterprise Partnership, 2022.Greater Lincolnshire LEP Local Skills Report [online]. Available at: https://www.greaterlincolnshirelep.co.uk/priorities-and-plans/priorities/priority-skills/local-skills-report/ [Accessed 12 July 2024].

Ref 12 ONS, 2023. Business Register and Employment Survey [online]. Available at: https://www.ons.gov.uk/ [Accessed 9 April 2025].

Ref 13 ONS, 2021. Census 2021 [online]. Available at: https://www.ons.gov.uk/census [Accessed 12 July 2024].

Ref 14 Visit Britain, 2020. The Value of Tourism in England [online]. Available at: https://www.visitbritain.org/research-insights/value-tourism-england#:~:text=England%E2%80%99s%20tourism%20sector%20contributes%20%C2%A3106%20billion%20to%20the,account%20%E2%80%93%20and%20it%20supports%202.6%20million%20jobs. [Accessed 12 July 2024].

Ref 15 Ministry of Housing, Communities, and Local Government, 2019. English Indices of Deprivation [online]. Available at: https://www.gov.uk/government/collections/english-indices-of-deprivation [Accessed 12 July 2024].

Ref 16 South East Lincolnshire Joint Strategic Planning Committee, 2019. South East Lincolnshire Local Plan [online]. Available at: https://southeastlincslocalplan.org/adopted-plan/ [Accessed 25 September 2024].

Ref 17 East Lindsey District Council, 2018. East Lindsey District Council Local Plan [online]. Available at: https://www.e-lindsey.gov.uk/media/9791/CoreStrategy/pdf/Final_Version_of_Core_Strategy_2018.pdf?m=1546595473230 [Accessed 25 September 2024].

Ref 18 North East Lincolnshire Council, 2018. North East Lincolnshire Council Local Plan 2013 – 2032 [online]. Available at: https://www.nelincs.gov.uk/assets/uploads/2018/05/20180518-AdoptedLocalPlan2018-WEB.pdf [Accessed 23 September 20248 January 2025]

Ref 19 ONS, 2018. Subnational population projections for England: 2018-based [online]. Available at: https://www.ons.gov.uk/ [Accessed 12 July 2024].

Ref 20 The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, [online] 2017. Available at: https://www.legislation.gov.uk/uksi/2017/571/contents [Accessed 25 September 2024]

Ref 21 Lincolnshire County Council, 2016. Minerals and Waste Local Plan [online]. Available at: https://www.lincolnshire.gov.uk/downloads/file/2361/core-strategy-and-development-management-policies [Accessed 25 September 2024].

Ref 22 Visit Britain, 2016. England Accommodation Stock Audit [online]. Available at: https://www.visitbritain.org/research-insights/england-accommodation-stock-audit [Accessed 4 July 2024].

Ref 23 Homes and Communities Agency, 2015. Calculating Cost Per Job, Best Practice Note 2015 (3rd Edition). Available at: https://new.sthelens.gov.uk/media/330898/cd-560-homes-and-communities-agency-hca-%C3%A2-calculating-cost-per-job%C3%A2-best-practice-note-3rd-edition-2015.pdf [Accessed 25 November 2024]

Ref 24 Fenland District Local Council, 2014. Fenland District Local Council Local Plan [online]. Available at: https://www.fenland.gov.uk/media/10010/Fenland-Local-Plan-May-2014/pdf/Fenland_Local_Plan1.pdf?m=1590591524653 [Accessed 25 September 2024].

Ref 25 Homes and Communities Agency, 2014. Additionality Guide Fourth Edition [online]. Available at: https://www.gov.uk/government/publications/additionality-guide [Accessed 25 September 2024].

Ref 26 Borough Council of King's Lynn and West Norfolk, 2011. King's Lynn and West Norfolk Local Plan [online]. Available at: https://www.west-norfolk.gov.uk/info/20219/core_strategy/112/core_strategy_explained [Accessed 25 September 2024].

Ref 27 ONS, 2011. Census 2011 [online]. Available at: https://www.ons.gov.uk/census/2011census [Accessed 12 July 2024].

Ref 28 National Grid (no date) The Holford Rules [online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13795The%20Holford%20Rules.pdf [Accessed 13 March 2025]

Ref 29 National Grid (no date) Horlock Rules [online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf [Accessed 13 March 2025]

Ref 30 Visit Britain, 2024. England Hotel Occupancy [online]. Available at: https://www.visitbritain.org/research-insights/england-hotel-occupancy-latest [Accessed 13 March 2025].

Ref 31 Nottinghamshire Live, 2018. Skegness fairground revealed as the most popular free attraction in the region [online]. Available at: https://www.nottinghampost.com/whats-on/whats-on-news/skegness-fairground-revealed-most-popular-1930479 [Accessed 12 July 2024].

Ref 32 National Grid,2024. Corridor Preliminary Routeing and Siting Study [online]. Available at: https://www.nationalgrid.com/document/352621/download [Accessed 25 March 2025].

Ref 33 Cambridgeshire and Peterborough Council, 2021. Cambridgeshire and Peterborough Minerals and Waste Local Plan 2036 [online]. Available at: https://www.cambridgeshire.gov.uk/business/planning-and-development/planning-policy/adopted-minerals-and-waste-plan [Accessed 25 March 2025].

Ref 34 Norfolk County Council, 2011. Norfolk Minerals and Waste Development Framework 2010-2026 [online]. Available at: https://www.norfolk.gov.uk/article/39049/Adopted-policy-documents. [Accessed 25 March 2025].

Ref 35 North East Lincolnshire Council, 2023. North East Lincolnshire Local Plan Review Draft Plan with options [online]. Available at: https://www.nelincs.gov.uk/assets/uploads/2024/01/2023-LocalPlanReview-DraftPlanWithOptions-Accessible.pdf. [Accessed 25 March 2025].

Ref 36 Borough Council of King’s Lynn & West Norfolk, 2021. King’s Lynn & West Norfolk Local Plan Review Pre-Submission Stage 2021 [online]. Available at: https://www.west-norfolk.gov.uk/info/951/local_plan_review_2016-2036_examination/986/local_plan_review_pre-submission_stage_2021/. [Accessed 25 March 2025].

8. Health and Wellbeing

nationalgrid

Contents

8. Health and Wellbeing

8.1 Introduction

8.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the route-wide assessment of the Health and Wellbeing assessment of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:

i. An introduction to the topic (section 8.1);

ii. Identification of key local and regional policy relevant to the assessment (section 8.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices;

iii. A summary of the assessment scoping process and the subsequent scope of the Health and Wellbeing assessment (section 8.3). Further detail is provided **within PEI Report Volume 3 Part A Appendix 4A Scoping Opinion Responses and Stakeholder Engagement Summary;**

iv. A high-level summary of the methodology of the Health and Wellbeing assessment route-wide (section 8.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;

v. A description of the environmental baseline within the Study Area relevant to the Health and Wellbeing assessment (section 8.5);

vi. A description of mitigation measures included for the purposes of the assessment reported within this PEI Report (section 8.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives and the Grimsby to Walpole Design Development Report**;

vii. The likely Health and Wellbeing effects arising during construction and operation of the Project, based upon the assessment completed to date (section 8.7); and

viii. An outline of the proposed monitoring requirements in relation to Health and Wellbeing (section 8.8).

8.1.2 Further supporting information is set out in **Table 8.1** below, including supporting chapters, figures and technical appendices.

Table 8.1 Supporting documentation

Supporting Information	Description
PEI Report Volume 2 Part C Figures	**Figure 8.1 Health and Wellbeing Study Area**

Supporting Information	Description
	Figure 8.2 Indices of Multiple Deprivation **Figure 8.3 Residential Properties** **Figure 8.4 Healthcare and Social Infrastructure** **Figure 8.5 Green Open Spaces** **Figure 8.6 Promoted Recreational Routes**
PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context	Presents a review of the legislation and policy relevant to the Project.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	Provides an overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 2A Environmental Legislation	Provides a list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform of the Environmental Statement (ES).
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	Provides a list of National and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part B Appendix 2.2C Local Policy Route-wide	Details planning policies applicable route-wide within the relevant local authority areas.
PEI Report Volume 3 Part A Appendix 5A Draft Outline Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent.
PEI Report Volume 3 Part C Appendix 8A Health and Wellbeing Baseline Statistics	Provides the Health and Wellbeing baseline statistics relevant to the baseline conditions described in Section s.5 of this chapter.
PEI Report Volume 3 Part C Appendix 8B Health and Wellbeing Evidence Review.	Presents the evidence reviewing the links between health determinants (environmental, social and economic factors that influence health) and health requirements, and provides commentary on the resulting effects on Health and Wellbeing based on a review of available literature.

8.1.3 There are interrelationships between the potential effects on Health and Wellbeing and other environmental topics. Therefore, please also refer to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:

i. **PEI Report Volume 2 Part B Section 1-7 Chapter 3 Visual -** visual impacts are taken into account when assessing neighbourhood quality and its impact on health in this chapter;

ii. **PEI Report Volume 2 Part B Section 1-7 Chapter 9 Traffic and Movement** - traffic impacts are taken into account when assessing neighbourhood quality and access to open space impacts, and their subsequent impacts on community health in this chapter**;**

iii. **PEI Report Volume 2 Part B Section 1-7 Chapter 10 Noise and Vibration -** noise impacts are taken into account when assessing neighbourhood quality, and its subsequent impacts on community health in this chapter;

iv. **PEI Report Volume 2 Part B Section 1-7 Chapter 11 Socio-economics, Recreation and Tourism -** employment findings are taken into account when assessing the impact on employment and its subsequent impacts on community health; and

v. **PEI Report Volume 2 Part B Section 1-7 Chapter 12 Air Quality -** air quality impacts are taken into account when assessing neighbourhood quality and its subsequent impacts on community health in this chapter.

8.2 Legislation and Policy Framework

Legislation and National Policy

8.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Legislative, Regulatory and Planning Policy Context** and supporting appendices, the details of which are set out in **Table 8.1**.

Regional and Local Policy

8.2.2 Regional and local plans or policies relevant to this assessment are as follows:

i. North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 1);

- Policy SO5 Social and Health Inequality; which stipulates that developments should narrow the gap in terms of social and health inequality by measures which include providing accessible employment and maintaining a network of accessible good quality open space.

ii. East Lindsey Local Plan Core Strategy (Adopted July 2018) (Ref 2);

- Policy SP13: Inland Employment, Policy SP25: Green Infrastructure; which stipulates that developments will not cause harm to informal or formal green and open space.

iii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 3);

- Policy S54: Health and Wellbeing; which stipulates that the potential for achieving positive mental and physical health outcomes should be taken into account when considering all development proposals.

iv. South East Lincolnshire Local Plan 2011-2036 (Adopted March 2019) (Ref 4);

- Policy 32: Community, Health and Well-being; which stipulates that developments should contribute to reducing health inequalities and improving community health and wellbeing.

v. Fenland Local Plan (Adopted May 2014) (Ref 5);

- Policy LP2: Facilitating Health and Wellbeing of Residents; which stipulates that developments should provide good access to health, leisure and recreation facilities and avoid adverse impacts on the health and wellbeing of residents.

vi. Kings Lynn & West Norfolk Borough Council Local Development Framework Core Strategy (Adopted July 2011) (Ref 6);

- Policy CS13: Community and Culture; which stipulates that developments should contribute to delivering community wellbeing.

8.2.3 For further detail please refer to **PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy** and **PEI Report Volume 3 Part A Appendix 2.2C Local Planning Policy: Route-wide.**

8.3 Scope of the Assessment

8.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 7) provided by the Planning Inspectorate on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 8). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the Health and Wellbeing chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Scoping Opinion Responses and Stakeholder Engagement Summary**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement.**

8.3.2 Non-statutory consultation feedback is summarised within the **Grimsby to Walpole Non-Statutory Consultation Feedback Report**.

8.3.3 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.

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

i. neighbourhood quality;

ii. mental health effects of Electromagnetic Fields (EMFs);

iii. access to healthcare and social infrastructure; and

iv. access to promoted recreational routes and open spaces.

8.4 Assessment Methodology

8.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Health and Wellbeing assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all defined and assigned to the assessment. The assessment has been undertaken based on preliminary Project design information.

8.4.2 The assessment of likely significant Health and Wellbeing effects will follow Institute of Environmental Management and Assessment (IEMA)'s guidance on *"Determining Significance for Human Health in Environmental Impact Assessment"* (Ref. 8.10). This guidance presents a framework that supports a proportionate approach to assessing significance, which can apply to all scales of EIA. Certain principles apply in all cases, including applying a population health approach (as opposed to health of individuals) and considering health inequalities.

8.4.3 Guidance and standards that have informed the PEI Report process are listed below (but not limited to) and will also be taken into account as part of the assessment:

i. IEMA (2022) Effective Scoping of Human Health in Environmental Impact Assessment (Ref 9);

ii. Highways England (2020) Design Manual for Roads and Bridge Document LA112 (Ref 11);

iii. IEMA (2017) Health in Environmental Impact Assessment: A Primer for a Proportionate Approach (Ref 12);

iv. Public Health England (PHE) The Public Health England Strategy 2020 to 2025 (Ref 13);

v. Public Health England (2020) Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning Regime (Ref 14);

vi. Institute of Health Equality (2010) Fair Society, Healthy Lives: The Marmot Review (Ref 15);

vii. Institute of Health Equality (2020) Healthy Equity in England: The Marmot Review 10 Years On (Ref 16);

viii. Institute of Health Equality (2020) Build Back Fairer: The COVID-19 Marmot Review (Ref 17);

ix. International Commission on Non-Ionising Radiation Protection (1998) Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields. Health Physics, 74(4), p.494. (Ref 18); and

x. The Control of Electromagnetic Fields at Work Regulations (2016) (Ref 19).

Assessment Assumptions and Limitations

8.4.4 The following limitations and assumptions, as listed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope,** have been identified for this route-wide assessment:

i. The preliminary assessment has been conducted under the premise that no public road closures will be required. Should road closures be required, it is further assumed that these will be very short-term.

ii. The assessment of the significance of effects will be carried out against a benchmark of current human health baseline conditions prevailing around the Project, as far as is possible within the limitations of such a dataset.

iii. Baseline data is also subject to a time lag between collection and publication. As with any dataset, these conditions may be subject to change over time which may influence the findings of the assessment.

8.4.5 These key parameters and assumptions will be reviewed based on the design presented in the Development Consent Order (DCO) application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions used within that assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

8.4.6 The PEI Report has undertaken all Health and Wellbeing assessment with the information currently available. Updates to the assessments conducted within this chapter will be required at ES stage as the other environmental topics listed in section 8.1 will also update their assessments at ES stage.

8.5 Baseline Conditions

Study Area

8.5.1 The route-wide Study Area for the assessment will vary by the type of health impact being assessed, but will include the whole spatial extent of the Project given this a route-wide assessment.

8.5.2 The Study Area will differ based on the receptor impacted. Receptors within 500m of the draft Order Limits and Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) are likely to experience environmental effects arising from construction/operation activities; whilst community severances effects could be experience beyond 500m particularly in rural areas; and employment effects will be experienced from a broader area.

8.5.3 The Study Area will comprise of 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 and Refined Siting Zone. This area is considered sufficient to cover the likely extent of environmental effects arising from the construction, maintenance and/or operational activities of the Project that are likely to give rise to Health and Wellbeing impacts. Where data for the Study Area is not available at an electoral ward level, local authority level data will be provided.

8.5.4 The electoral wards and local authorities are aligned with the seven ‘Sections’ of the Project route that comprise the Study Area for this assessment, as detailed in **PEI Report Volume 3 Part A Chapter 5 Project Description**. The Sections are split from north to south by the geographical alignment of the draft Order Limits and Refined Siting Zone and are listed as follows:

i. Section 1 – New Grimsby West Substation;

ii. Section 2 – New Grimsby West Substation to New Lincolnshire Connection Substation (LCS) A;

iii. Section 3 – New Lincolnshire Connection Substation (LCS) A and B;

iv. Section 4 – New Lincolnshire Connection Substation (LCS) 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.

8.5.5 The Study Area sits alongside corresponding regions of Yorkshire and the Humber (region for North East Lincolnshire), East Midlands (region for East Lindsey, West Lindsey, Boston and South Holland) and East of England (region for Fenland and King's Lynn and West Norfolk) and the national comparator of England.

8.5.6 **Table 8.2** below sets out the electoral wards and local authorities (district) each Section of the Project passes through. A further list containing the specific communities located within each Section can be found in Table 1.1 within **PEI Report Volume 3 Part C Appendix 8A Health and Wellbeing Baseline Statistics**.

Table 8.2 Electoral wards and local authorities within Grimsby to Walpole Sections

Section	Section Name	Electoral Ward	Local Authority (District)
1	New Grimsby West Substation	• Wolds • Freshney • Caistor and Yarborough	North East Lincolnshire West Lindsey
2	New Grimsby West Substation to New Lincolnshire Connection Substation (LCS) A	• Wolds • Waltham • South (North East Lincolnshire) • Holton-le-Clay and North Thoresby • Fulstow • Grimoldby • Legbourne • Withern and Theddlethorpe	North East Lincolnshire East Lindsey
3	New Lincolnshire Connection Substations (LCS) A and B	• Withern and Theddlethorpe • Alford	East Lindsey
4	New Lincolnshire Connection Substation (LCS) B to Refined Weston Marsh Substation Siting Zone	• Alford • Willoughby with Sloothby • Chapel St. Leonards • Ingoldmells	East Lindsey Boston South Holland

Section	Section Name	Electoral Ward	Local Authority (District)
		• Burgh le Marsh • Croft • Wainfleet • Friskney • Halton Holegate • Sibsey and Stickney • Swineshead and Holland Fen • Kirkton and Frampton • Five Village • Old Leake and Wrangle • Donington, Quadring and Gosberton • Pinchbeck and Surfleet • Moulton, Weston and Cowbit	
5	Refined Weston Marsh Substation Siting Zone	• Moulton, Weston and Cowbit • Pinchbeck and Surfleet	South Holland
6	Refined Weston Marsh Substation Siting Zone to New Walpole B Substation	• Moulton, Weston and Cowbit • Spalding St Paul's Ward • Whaplode and Holbeach St John's • Fleet • Gedney • The Saints • Leverington • Long Sutton • Walsoken, West Walton and Walpole	South Holland Fenland King's Lynn and West Norfolk
7	New Walpole B Substation	• Walsoken, West Walton and Walpole	King's Lynn and West Norfolk

Data Collection

8.5.7 The following data has been used to inform the baseline conditions:

i. Ministry of Housing, Communities and Local Government (MHCLG) (2019) Indices of Multiple Deprivation (Ref 20);

ii. Office of National Statistics (ONS) (2022) Census 2021 (Ref 21);

iii. ONS (2023) Annual Population Survey (Ref 22);

iv. Office for Health Improvement and Disparities (OHID) (2022) Local Health, August 2022 Update (Ref 23);

v. Ordnance Survey (Accessed 2024) AddressBase Plus (Ref 24);

vi. Public Health England (2021-2023) Local Health, public health data for small geographic areas (Ref 25); and

vii. Sustrans (Accessed 2024) Open Data Portal (Ref 26).

Evidence Review

8.5.8 **PEI Report Volume 3 Part C Appendix 8B Health and Wellbeing Evidence Review** outlines the evidence reviewing the links between health determinants (environmental, social and economic factors that influence health) and resulting effects on Health and Wellbeing according to the available literature. This provides background to the assessments conducted within this chapter.

Existing Baseline

8.5.9 The following section provides a summary of the Health and Wellbeing baseline. The full baseline is set out in **PEI Report Volume 3 Part C Appendix 8B Health and Wellbeing Evidence Review**. This section should also be read in conjunction with the following supporting figures and appendices as found within **PEI Report Volume 2**:

i. **PEI Report Volume 2 Part C Figure 8.1 Health and Wellbeing Study Area**;

ii. **PEI Report Volume 2 Part C Figure 8.2 Indices of Multiple Deprivation**;

iii. **PEI Report Volume 2 Part C Figure 8.3 Residential Properties**;

iv. **PEI Report Volume 2 Part C Figure 8.4 Healthcare and Social Infrastructure**;

v. **PEI Report Volume 2 Part C Figure 8.5 Green Open Spaces**;

vi. **PEI Report Volume 2 Part C Figure 8.6 Promoted Recreational Routes**;

vii. **PEI Report Volume 3 Part C Appendix 8A Health and Wellbeing Baseline Statistics**; and

viii. **PEI Report Volume 3 Part C Appendix 8B Health and Wellbeing Evidence Review**.

8.5.10 Baseline conditions have been gathered from desk-based information and presented with reference to the ward level and Section of the Project that they are located.

8.5.11 The Health and Wellbeing baseline comprises information about the health characteristics of the local area, covering physical health, as well as information that can be used to identify potential vulnerable populations (age, economic status, disability). When combined with environmental information, this provides the context necessary to assess the potential effects of the Project on Health and Wellbeing.

Population

8.5.12 The population profile by age across the Study Areas of the route has little variation, with all Sections showing a disproportionately higher population of residents aged 65 and older when compared with regional and national averages. Overall, the proportions of working aged people (16-64) and children (under 16) are lower than regional and national averages.

8.5.13 The locations of the residential properties within the Study Area are shown in **PEI Report Volume 2 Part C Figure 8.3 Residential Properties**

Employment

8.5.14 The unemployment profile across the Study Area has little variation, with the regions of East Midlands, Yorkshire and the Humber, and North East Lincolnshire having an unemployment rate in line with the national average (4 per cent). However, at the district level, North East Lincolnshire (Sections 1 and 2) has an economic activity rate of 55 per cent, and West Lindsey (Section 1) has an economic activity rate of 54 per cent. These are both lower than the national average (59 per cent) and suggest that Sections 1 and 2 have higher rates of unemployment than the rest of the Study Area.

8.5.15 Overall, the employment deprivation rates across the Study Area are in line with each other (average rates falling within the third to fifth most deprived deciles). However, the local authority area of East Lindsey has a higher employment deprivation rate when compared with the national average (an average employment deprivation rate falling within the third most deprived decile, compared with the national average decile of 6). As a result, Sections 2 and 3, which include East Lindsey, have a rate of employment deprivation higher than the national average, and the highest deprivation of the Sections.

Local health

8.5.16 Health indicators across the Study Area show a varied composition when compared with the national average.

8.5.17 Overall, there are generally higher instances of people self-reporting bad health than the national average across the Study Area. Section 4 has particularly high rates of poor health, with all three local authorities (East Lindsey, Boston and South Holland) covered reporting worse outcomes than the national average, and multiple electoral wards reporting even poorer outcomes than these authorities. The electoral wards with the highest incidences of poor health within Section 4 are the electoral wards of Chapel St Leonards and Ingoldmells, who both report 39 per cent of the population being in bad health.

8.5.18 Sections 2, 3, 4, 6 and 7 have a higher proportion of disabled people when compared to the national average. The highest proportions of disabled people are located in Section 4, with 34 per cent of Chapel St Leonards' residents and 32 per cent Ingoldmells' residents reporting a disability.

8.5.19 Overall, life expectancy across the majority of the Study Area is in line with national averages. The highest life expectancies for both men and women are found in Section 2 in the Fulstow ward (87 for women) and Grimoldby (83 for men). Lowest life expectancies for both men and women are found in Section 4 in Ingoldmells (72 for men and 76 for women).

8.5.20 Emergency Chronic Obstructive Pulmonary Disease (COPD) admissions vary across the Study Area. The majority of electoral wards with higher than national average rates of admission are located in Sections 4, 6, and 7. Sections 4 and 7 similarly record higher than national average mortality rates from respiratory disease. The highest incidences of mortality from respiratory disease is in Ingoldmells ward in Section 4 (200 per 100,000 population).

Wellbeing

8.5.21 The Health Baseline uses self reported personal wellbeing estimates from Public Health England to provide an indication of wellbeing across the Study Area. All Sections report wellbeing related to anxiety, happiness, life satisfaction, and worthwhile indicators in line with the national average.

Healthcare and Social Infrastructure

8.5.22 A list of identified healthcare and social infrastructure receptors identified across the Study Area is included in **PEI Report Volume 3 Part C Appendix 8A: Health and Wellbeing Baseline Statistics.**

Open and Green Space

8.5.23 All identified areas of green and open space are included in **PEI Report Volume 2 Part C Figure 8.5 Green and Open Space.**

Vulnerable groups

8.5.24 The local authorities within the Study Area present differences in terms of vulnerable groups and associated sensitivities in Human Health and Wellbeing, for example:

i. all Sections within the Project have a greater proportion of older residents compared to the national average;

ii. all Sections, excluding Sections 1 and 5, have a higher proportion of disabled residents compared to the national average; and

iii. the Sections which fall within the local authorities of North East Lincolnshire and West Lindsey (Sections 1 and 2) have a lower economic activity rate compared to the national average.

8.5.25 An Equality Impact Assessment (EqIA) will be produced which considers the impact of the Project on vulnerable groups. The EqIA will be presented alongside the ES for DCO submission.

Future Baseline

8.5.26 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including: those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.

8.5.27 At this preliminary stage, a full assessment of the implications of any confirmed development projects with regard to future baseline conditions has not been

undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information Annex I Developments for Consideration Within the Future Baseline.** This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.

8.5.28 No major changes to the baseline are anticipated which would impact Health and Wellbeing.

8.5.29 All required baseline data has been obtained, as detailed in 8.5.7. However, ongoing reviews of this data will be undertaken to ensure the assessment in the ES incorporates the latest available information.

8.6 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

8.6.1 The Project and draft Order Limits and Refined Siting Zone have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 27) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 28) which apply to design and siting of substations . These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 29), which considers the impacts across a wide range of criteria, including environmental and socio- economic, and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**. Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.

8.6.2 Following selection of the preferred route corridor, environmental specialists have been integral to ongoing design refinement of works route-wide.

8.6.3 Sensitive routing and siting is a principal design measure which has been embedded into Project design since the start, to avoid and reduce impacts on identified receptors, including Health and Wellbeing receptors.

8.6.4 The Scheme will be designed and constructed in line with guidance outlined in the International Commission on Non-Ionising Radiation Protection (1998) Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields.

8.6.5 National Grid Electricity Transmission (NGET) are aware that there may be concern regarding the potential effects of EMFs, despite the measures in place to protect against these.

8.6.6 To address any concerns or anxiety, National Grid offer open communication on the issue, providing information on the science, research and measures that will be applied to protect against EMF effects. These measures include:

i. Providing open and transparent information about EMFs on the NGET website (www.emfs.info) which is linked to all National Grid project websites for members of the public to access.

ii. NGET operating a helpline on EMFs to answer any questions on this subject. This and the website are aimed at providing information on EMFs to help reduce anxiety or concern around EMFs.

iii. Ensuring EMF experts are present at public consultation events to address any questions or concerns on EMFs.

iv. The Project offering 'ask the expert' sessions to address any questions or concerns on EMFs.

Control Mitigation Measures

8.6.7 An Initial Preliminary Code of Construction Practice (CoCP) for the Project is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice.** Measures relevant to the control and management of impacts that could affect Health and Wellbeing are:

i. GG04: Construction workers will undergo training to increase their awareness of environmental issues as applicable to their role on the Project. Topics will include where appropriate:

- pollution prevention and pollution incident response;
- dust management and control measures;
- location and protection of sensitive environmental sites and features;
- adherence to protected environmental areas around sensitive features;
- working hours and noise and vibration reduction measures;
- working with potentially contaminated materials;
- waste management and storage;
- flood risk response actions;
- agreed traffic routes, access points, etc.;
- soil management; and
- drainage management.

ii. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management Plan (MWMP) and a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Strategy (PRoWMP) Overarching Written Scheme of Investigation (WSI), Biodiversity Management Plan, Noise and Vibration Management Plan, Pollution Prevention Plan, Foundation Works Risk Assessment, Carbon efficiency Plan, Dust Management Plan (DMP),Drainage Management Plan (DrMP), along with a Soil Management Plan (SMP) will be produced prior to construction. These are collectively referred to as 'the environmental control Plans.'

iii. GG07: The CEMP will set out site specific measures and construction methodologies to avoid or reduce potential effects of the Project on the environment during construction. The contractor(s) shall undertake regular site inspections to check conformance to the Management Plans.

iv. GG11: Any activity carried out or equipment located within a construction compound that may produce a noticeable nuisance, including but not limited to dust, noise, vibration and lighting, will be located away from sensitive receptors such as residential properties or ecological sites where practicable.

v. GG12: Appropriate site layout and housekeeping measures will be implemented by the contractor(s) at all construction sites. This will include but not be limited to:

- inspecting and collecting any waste or litter found on-site;
- locating or designing site offices and welfare facilities to limit the overlooking of residential properties;
- locating designated smoking/vaping areas to avoid nuisance to neighbours;
- managing staff/vehicles entering or leaving the site, especially at the beginning and end of the working day; and
- managing potential off-site contractor and visitor parking.

vi. GG25: Members of the community and local businesses will be kept informed regularly of the works through active community liaison and groups with local membership. This will include notification of noisy activities, heavy traffic periods and start and end dates of key phasing. A contact number will be provided which members of the public can use to raise any concerns or complaints about the Project. All construction-related complaints will be logged in a complaints register, together with a record of the responses given and actions taken.

vii. TT01: The contractor(s) will implement a monitoring and reporting system to check compliance with the measures set out within the CTMP.

viii. TT02: All affected Public Rights of Way (PRoWs) will be identified, and any potential permanent or temporary closures detailed in the DCO. All designated PRoWs crossing the working area will be managed with access only closed for periods while construction activities occur. Any required diversions will be clearly marked at both ends with signage explaining the diversion, the duration of the diversion and a contact number for any concerns and will be subject to a PRoWMP. PRoWs crossing the working areas will be managed in discussion with the relevant local authorities and potential temporary closures applied for discussed with the relevant local authority. Access disruption would be reduced as reasonably practicable while construction activities occur.

ix. NV01: Construction working will be undertaken within the agreed working hours set out within the DCO unless the works are under an exception to the set working hours in which case they will be carried out in a manner that minimises noise and vibration at all times. Best practicable means to reduce construction noise will be set out within the CEMP.

x. AQ01: Dust management measures will be set out in the Dust Management Plan (DMP) as part of the CEMP. This will be specific to particular phases of the Project. The DMP, will include, but not be limited to the following:

- communications to include display of the name and contact details of person(s) accountable for air quality and dust issues on the site boundary;
- daily on-site and off-site inspections will be undertaken by the Contractor(s), where receptors (including roads) are nearby, to monitor dust, record inspection results, and make the log available to the local authority when

asked. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100m of site boundary, with cleaning to be provided if necessary. The frequency of site inspections will be increased by the person accountable for air quality and dust issues on-site when activities with a high potential to produce dust are being carried out, during prolonged dry or windy conditions or in response to complaints or an incident resulting in dust emissions. Inspection results will be recorded, and an inspection log made available to the local authority when asked;

- site management will document all dust and air quality complaints, identify causes and take measures to reduce emissions in a timely manner, and record the measures taken;
- preparation and management of the site ensuring that machinery and dust causing activities are located as far as possible away from receptors, screens/barriers are erected around dusty activities/materials and are at least as high as any stockpiles, use wet methods to keep site fencing, barriers and scaffolding clean, remove materials that have a potential to produce dust from site as soon as possible, unless being re-used on-site where they must be covered, seeded, or fence stockpiles used to prevent wind whipping;
- monitoring and inspections to include evolving evaluation of Project phases as required and practicable; and
- construction operations will only use cutting, grinding or sawing equipment fitted or in conjunction with suitable dust suppression techniques such as water sprays or local extraction, for example, suitable local exhaust ventilation systems. Ensure an adequate water supply on the site for effective dust/particulate matter suppression/mitigation, using non-potable water where possible and appropriate. Use enclosed chutes and conveyors and covered skips. Minimise drop heights from conveyors, loading shovels, hoppers and other loading or handling equipment and use fine water sprays on such equipment wherever appropriate. Ensure equipment is readily available on-site to clean any dry spillages and clean up spillages as soon as reasonably practicable after the event using wet cleaning methods.

Additional Mitigation Measures

8.6.8 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above. Such measures typically constitute the inclusion of additional features which specifically serve an environmental mitigation function, to reduce the scale of potential impacts.

8.6.9 Potential additional mitigation measures which may be required to reduce the effects of the Project upon Health and Wellbeing remain in the early stages of development based upon an iterative process, informed by ongoing environmental assessment include:

i. Any additional mitigation and enhancement measures that are set out at ES stage in relation to the Visual, Noise and Vibration and Transport and Movement topics should be undertaken in order to further reduce any possible impacts on neighbourhood quality.

ii. Further mitigation and enhancement opportunities in relation to Health and Wellbeing may be identified as the ES process continues.

iii. Any measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders and reported in the ES.

8.7 Preliminary Assessment of Effects

8.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Study Area, as a result of construction, maintenance and/or operational activities associated with the Project.

8.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described.

8.7.3 A supplementary summary of all non-significant effects is also included within this section in **Table 8.3**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

8.7.4 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project, statutory consultation feedback and further stakeholder engagement. A full assessment will be included within the ES submitted with the DCO application

Likely Significant Effects

Construction

Employment

8.7.5 There are clear links between employment and health and wellbeing, with multiple reports concluding that unemployment contributes to increased deprivation and poorer physical and mental health outcomes. As such, any changes to employment as a result of the Project may impact the health and wellbeing of local residents.

8.7.6 No significant effects upon employment during construction of the Project across the Study Area are anticipated. These non-significant effects are reported in **Table 8.3**.

Neighbourhood Quality

8.7.7 No significant effects upon neighbourhood during construction of the Project across the Study Area are anticipated. These non-significant effects are reported in **Table 8.3**.

Access to Promoted Recreational Routes and open spaces

8.7.8 No significant effects upon access to promoted recreational routes and open spaces during construction of the Project across the Study Area are anticipated. These non-significant effects are reported in **Table 8.3**.

Access to healthcare and social infrastructure

Potential temporary or permanent changes in access to healthcare and social infrastructure potentially leading to worsened health outcomes

8.7.9 There is considerable evidence to indicate that there is a strong correlation between health outcomes and access to healthcare and education services. Access to education, and subsequent qualifications, is linked with improved physical and mental health; whilst reduced access to health services, such as through community severance or poor transport options, is linked with poorer physical health outcomes.

8.7.10 The Health and Wellbeing assessment uses the Traffic and Movement assessment in order to identify potential impacts on access to health and social infrastructure. At PEI Report stage, the Traffic and Movement chapter is identifying routes where there may be significant impacts identified at ES Stage. As such, no full assessment can take place at this stage; however the sections below identify key health and social infrastructure receptors which may experience significant impacts. These receptors are identified as being accessed via the key routes flagged in Traffic and Movement as potentially experiencing significant impacts.

Section 1 – New Grimsby West Substation

8.7.11 No changes in access to healthcare and social infrastructure during construction of the Project are anticipated in Section 1.

Section 2 – New Grimsby West Substation to New Lincolnshire Connection Substation A

8.7.12 No changes in access to healthcare and social infrastructure during construction of the Project are anticipated in Section 2.

Section 3 – New Lincolnshire Connection Substation A and B

8.7.13 No changes in access to healthcare and social infrastructure during construction of the Project are anticipated in Section 3.

Section 4 – New Lincolnshire Connection Substation B to Refined Weston Marsh Substation

8.7.14 Section 4 has a number of health and social infrastructure receptors which could be impacted by changes in access. These include:

i. Frithville Primary School

ii. Gipsey Bridge Academy

iii. Gipsey Bridge Pre- School

Section 5 – Refined Weston Marsh Substation

8.7.15 No changes in access to healthcare and social infrastructure during construction of the Project are anticipated in Section 5.

Section 6 – Refined Weston Marsh Substation to New Walpole B Substation

8.7.16 Section 6 has a number of health and social infrastructure receptors which could be impacted by changes in access. These include:

i. Kinderley Primary School

ii. ABC Pre-School

Section 7 – New Walpole Substation

8.7.17 No changes in access to healthcare and social infrastructure during construction of the Project are anticipated in Section 7.

Operation and maintenance

8.7.18 No effects as a result of the maintenance and/or operational activities associated with the Project are considered likely to be significant following the implementation of Design and Control measures. Non-significant effects anticipated during the operational phase of the Project are therefore reported within **Table 8.3** effects below.

Likely Non-Significant Effects

8.7.19 For completeness, **Table 8.3** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Health and Wellbeing effects.

Table 8.3 Preliminary summary of non-significant effects

Receptor	Impact	Sensitivity/Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Construction					
Employment					
Local residents	Potential increase in employment may have impact upon local residents during construction of the Project.	Medium- the sensitivity of the receptor has been defined as medium, as there are higher rates of unemployment in Sections 1 and 2 of the routes, as well as generally higher rates of poor health and deprivation across the Project baseline compared with the national average.	Small - the magnitude of change is assessed as small, as the number of jobs likely to be created for local people is likely to be low, in line with the Socio-Economic Assessment.	Minor (not significant)	There are clear links between employment and health and wellbeing, with multiple reports concluding that unemployment contributes to increased deprivations and poorer health outcomes. As such, any changes to employment as a result of the Project may impact the health and wellbeing of local residents. As outlined in this table, the sensitivity of the receptor is medium; whilst the magnitude of change is low. As such, the effect will be minor, which would not be significant.
Neighbourhood quality					
Local residents	Potential change in neighbourhood quality as a result of a combination of significant residual	Medium – the sensitivity of the receptor has been defined as medium as there to areas with	Details of the change have not yet been confirmed and as such	Significant effects cannot be ruled out at this stage. Further details	Health and Wellbeing can be adversely impacted due to the in-combination effects of noise, air quality, visual changes, and traffic impacts.

Receptor	Impact	Sensitivity/Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	(post-mitigation) effects reported in other topics, specifically noise, vibration, air quality, traffic and visual effects.	moderate levels of deprivation.	a magnitude cannot be assigned.	and assessment will be presented as part of the ES.	This can lead to increase blood pressure, heart disease, increase sleep disturbance, and adversely impact general wellbeing. Details of this cannot be confirmed until further Traffic and Movement assessment data is collected, which will be presented at ES stage.
Access to promoted recreational routes and open spaces					
Users of the Wanderlust Way	Access to the promoted recreational routes may be impacted by construction routes and construction works	Low- the sensitivity of the receptor is low, as it is not a major source of recreation in the area, nor does it provide links between communities.	Negligible- the magnitude of change is considered to be low as the Traffic and Movement Assessment does not predict any closures or impact on the route	Minor (not significant)	There are clear links between access to promoted recreational routes, open space, and improved mental and physical health outcomes. The sensitivity of the receptor is low, and the magnitude of change is negligible. Therefore, the impact is minor (non- significant)
Users of the Greenwich Meridian Trail	Access to the national walking and cycling route may be impacted by construction related closures or delays	High- the sensitivity of the receptor is high as it is a nationally promoted walking and cycling route	Negligible- the magnitude of change is considered to be low as the Traffic and Movement Assessment does not predict any closures or impact on the route	Minor (not significant)	The sensitivity of the receptor is high, and the magnitude of change is negligible. Therefore, the impact is minor (non- significant)

Receptor	Impact	Sensitivity/Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Users of National Cycle Network Route 1	Access to the national walking and cycling route may be impacted by construction related closures or delays	High- the sensitivity of the receptor is high as it is a nationally promoted cycling route	Negligible- the magnitude of change is considered to be low as the Traffic and Movement Assessment does not predict any closures or impact on the route	Minor (not significant)	The sensitivity of the receptor is high, and the magnitude of change is negligible. Therefore, the impact is minor (non- significant)
Local residents that use the River Witham recreationally	Access to the river may be impacted by the proposed stringing of the overhead lines during construction	Low - the sensitivity of the receptor is low, as it is not a major source of recreation in the area, nor does it provide links between communities.	Low- the magnitude of change is considered to be low, as any temporary closures of the river will be implemented overnight; and any work undertaken outside of peak operation times	Minor (not significant)	The sensitivity of the receptor is low, and the magnitude of change is low, The impact is therefore minor (not significant).
Local residents that use the River Welland recreationally and for navigation.	Access to the river may be impacted by the proposed stringing of the overhead lines between pylons during construction	Low- the sensitivity of the receptor is low, as it is not a major source of recreation in the area, nor does it provide links between communities	Low- the magnitude of change is considered to be low, as any temporary closures of the river will be implemented overnight.	Minor (not significant)	The sensitivity of the receptor is low and the magnitude of change is low. The impact is therefore minor (not significant).
Local residents that use the River Nene recreationally and for navigation.	Access to the river may be impacted by the proposed stringing of the overhead lines between nearby	Low- the sensitivity of the receptor is low, as it is not a major source of recreation in the area, nor does it provide links between communities.	Low- the magnitude of change is considered to be low, as any temporary closures of the river will be implemented overnight.	Minor (not significant)	The sensitivity of the receptor is low and the magnitude of change is low. The impact is therefore minor (not significant).

Receptor	Impact	Sensitivity/Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	proposed pylons during construction				
Users of the Nene Way	Access to the riverside walking route may be impacted by the proposed stringing of the overhead lines between nearby proposed pylons during construction	Low- the sensitivity of the receptor is low, as it is not a major source of recreation in the area, nor does it provide links between communities.	Negligible- the magnitude of change is considered to be negligible as the Traffic and Movement Assessment does not predict any closures or impact on the route.	Minor (not significant)	The sensitivity of the receptor is low, and the magnitude of change is negligible. Therefore, the impact is minor (non- significant)
Local residents using the West Walton Jubilee Walk	Temporary re-diversion of the West Walton Jubilee Walk affecting health outcomes	Low- the sensitivity of the receptor is low, as it will be used for recreational purposes and is not used as a link between communities.	Details of the change have not yet been confirmed and as such a magnitude cannot be assigned.	Significant effects cannot be ruled out at this stage. Further details and assessment will be presented as part of the ES.	The adopted unsurfaced road providing a 'cut-through' link of the West Walton Jubilee Walk will need to be permanently closed or diverted as a result of construction of the substation within Section 7. Details of this 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. Further details and assessment will be presented as part of the ES.
Operation					
Neighbourhood Quality					

Receptor	Impact	Sensitivity/Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Local residents	Potential permanent changes in neighbourhood quality during operation and maintenance as a result of a combination of significant residual (post-mitigation) effects reported in other topics, specifically noise, vibration, air quality and visual effects.	Medium - the sensitivity of the receptor has been defined as medium as there to areas with moderate levels of deprivation.	Negligible – as no significant residual noise or air quality impacts were reported with mitigation in place, no changes in neighbourhood quality during operation are anticipated	No impacts upon neighbourhood quality.	Health and Wellbeing can be adversely impacted due to the combined impacts of noise, visual changes, air pollution, and increased transport. This can lead to increase blood pressure, heart disease, increase sleep disturbance, and adversely impact general wellbeing. No residual significant operational air quality, noise or traffic impacts have been identified during operation of the infrastructure. As a result, no neighbourhood quality effects are identified as a result of the maintenance and/or operational activities associated with the Project.
Mental health effects of EMF					
Mental health of local residents	Potential adverse impact on mental health of local residents associated with the generation of EMFs. Communities which are located closest to the Project route and where EMF anxieties	Low - the sensitivity of the receptor is low, as although there is a higher level of poorer health generally across the route, only a small proportion of the population are likely to be living near to a pylon	Small- the magnitude of change is likely to be small, due to the mitigation listed in Column 6 to help lessen anxieties of local people.	Minor (not significant)	Whilst there is no evidence to suggest that electric and magnetic fields are harmful at the levels found in homes; there can be a mental health impact due to increased anxieties regarding possible harm As set out in section 8.6, the Project will be designed in

Receptor	Impact	Sensitivity/Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	and resultant impacts upon mental health may be highest are as follows (identified by reviewing the proximity of homes to the draft Order Limits and Refined Siting Zone): • Brigsley, North Thoresby, small settlements north of Withern and Tothill (Section 2); • Saleby, Bilsby (Section 3); • Thurlby, Thorpe Fendyke, Northlands, Gipsey Bridge, Langrick Bridge, Brothertoft, Hubberts Bridge, Bicker Haven (Section 4); • Individual homes south of the River Wellend (Section 5); • Whaplode Fen, Whaplode St. Catherine,	and affected by heightened anxieties.			accordance with National Grid design standards and will be compliant with the guidelines and precautionary policies related to ensure that all equipment complies with public EMF exposure limits. In addition, to help address concerns or anxieties of members of the public around effects of EMF, open and transparent information is provided about EMFs on the NGET website (www.emfs.info) which is linked on all National Grid project websites for members of the public to access. NGET also operate a helpline on EMFs to answer any questions on this subject. This, and the website, are aimed at providing information on EMFs to help reduce anxiety or concern. The sensitivity of the receptor is low and the magnitude of change is small. Therefore, the impact is minor (not significant).

Receptor	Impact	Sensitivity/Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	Holbeach St Johns, Newton-in-the Isle, Tydd St Giles, Four Gites, Ingleborough (Section 6); and • Walton (Section 7).				
Access to promoted recreational routes and open spaces					
Local residents using the West Walton Jubilee Walk	Permanent re-diversion or closure of the West Walton Jubilee Walk affecting health outcomes (access to promoted recreational routes and open spaces).	Low- the sensitivity of the receptor is low, as it will be used for recreational purposes and is not used as a link between communities.	Details of the change have not yet been confirmed and as such a magnitude cannot be assigned.	Significant effects cannot be ruled out at this stage. Further details and assessment will be presented as part of the ES.	The adopted unsurfaced road providing a 'cut-through' link of the West Walton Jubilee Walk will need to be permanently closed or diverted as a result of construction of the substation within Section 7. Details of this 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. Further details and assessment will be presented as part of the ES.

8.7.20 Where no changes are anticipated as a result of the Project, this is reported below also.

Construction

Access to promoted recreational routes and open spaces

8.7.21 No temporary or permanent changes in access to promoted recreational routes affecting health outcomes in are expected during construction of the Project in Sections 1, 2, 3 or 5.

Potential temporary or permanent changes in access to open space affecting health outcomes

8.7.22 As set out in **PEI Report Volume 3 Part C Appendix 8B Health and Wellbeing Evidence Review**, there is a moderate link between access to open space and health outcomes. Open space can create opportunities for recreation and social engagement, which can improve mental wellbeing; whilst also creating opportunity for sports and physical activity which can improve physical health.

8.7.23 No significant impacts upon access to open space have been identified.

Access to healthcare and social infrastructure

8.7.24 No temporary or permanent changes in access to healthcare and social infrastructure in are expected during construction of the Project in Sections 1, 2, 3, 5 and 7.

Operation and maintenance

Access to promoted recreational routes and open spaces

8.7.25 No temporary or permanent changes in access to promoted recreational routes affecting health outcomes as a result of the maintenance and/or operational activities associated with the Project are expected in Sections 1-6.

8.8 Monitoring

8.8.1 Monitoring requirements to reduce or eliminate impacts on Health and Wellbeing will be set out and secured in the CEMP and CTMP that will be produced prior to construction of the Project to accompany the DCO application.

8.8.2 No other monitoring specific to potential Health and Wellbeing impacts is currently proposed.

References

Ref 1 North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) - Policy SO2 Social and Health Inequality.

Ref 2 East Lindsey Local Plan Core Strategy (Adopted July 2018) – Policy SP13: Inland Employment, Policy SP25: Green Infrastructure.

Ref 3 Central Lincolnshire Local Plan (Adopted April 2023) - Policy S54: Health and Wellbeing

Ref 4 South East Lincolnshire Local Plan 2011-2036 (Adopted March 2019) - Policy 32: Community, Health and Well-being.

Ref 5 Fenland Local Plan (Adopted May 2014) – Policy LP2: Facilitating Health and Wellbeing of Residents.

Ref 6 Kings Lynn & West Norfolk Borough Council Local Development Framework Core Strategy (Adopted July 2011) – Policy CS13: Community and Culture.

Ref 7 The Planning Inspectorate (2024). Scoping Opinion: Proposed Grimsby to Walpole Project [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000109-Scoping%20Opinion%202017%20EIA%20Regs.pdf [Accessed 18 October 2024].

Ref 8 National Grid Electricity Transmission (2024). Grimsby to Walpole Environmental Impact Assessment Scoping Report [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000004-EN020036%20-%20Scoping%20Report%20Volume%201%20Main%20Report.pdf [Accessed 18 October 2024].

Ref 9 IEMA (2022) Effective Scoping of Human Health in Environmental Impact Assessment

Ref 10 IEMA (2022) Determining Significance for Human Health in Environmental Impact Assessment

Ref 11 Highways England (2020) Design Manual for Roads and Bridge Document LA112

Ref 12 IEMA (2017) Health in Environmental Impact Assessment: A Primer for a Proportionate Approach

Ref 13 Public Health England (PHE) (2020) The Public Health England Strategy 2020 to 2025

Ref 14 PHE (2020) Advice on the content of Environmental Statements accompanying an application under the Nationally Significant Infrastructure Planning Regime

Ref 15 Institute of Health Equality (2010) Fair Society, Healthy Lives: The Marmot Review

Ref 16 Institute of Health Equality (2020) Healthy Equity in England: The Marmot Review 10 Years On

Ref 17 Institute of Health Equality (2020) Build Back Fairer: The COVID-19 Marmot Review

Ref 18 International Commission on Non-Ionising Radiation Protection (1998) Guidelines for Limiting Exposure to Time-Varying Electric, Magnetic and Electromagnetic Fields. Health Physics, 74(4), p.494.

Ref 19 The Control of Electromagnetic Fields at Work Regulations (2016)

Ref 20 Ministry of Housing, Communities and Local Government, (2019). Indices of Multiple Deprivation

Ref 21 Office of National Statistics (ONS), (2022). Census 2021.

Ref 22 Office of National Statistics, (2023). Annual Population Survey.

Ref 23 Office for Health Improvement and Disparities (OHID), (2022). Local Health, August 2022 Update.

Ref 24 Ordnance Survey (Accessed 2024). AddressBase Plus.

Ref 25 Public Health England, (2021-2023). Local Health, public health data for small geographic areas. (Ref 6).

Ref 26 Sustrans (Accessed 2024). Open Data Portal.

Ref 27 National Grid (1959) 'The Holford Rules and Supplementary Guidance notes'. London: National Grid [online]. Retrieved from: https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf

Ref 28 National Grid (no date) Horlock Rules [online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf [Accessed 13 March 2025]

Ref 29 National Grid, January 2024, Grimsby to Walpole: Corridor and Preliminary Routing and Siting Study. Available at: https://www.nationalgrid.com/document/352621/download [Accessed 20 September 2024].

9. Climate Change

nationalgrid

Contents

9. Climate Change

9.1 Introduction

9.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the route-wide assessment of the Climate Change for the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:

i. An introduction to the topic (section 9.1).

ii. Identification of key local and regional policy relevant to the assessment (section 9.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices.

iii. A summary of the assessment scoping process and the subsequent scope of the Climate Change assessment (section 9.3). Further detail is provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.

iv. A high-level summary of the methodology of the Climate Change assessment route-wide (section 9.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

v. A description of the environmental baseline within the route-wide Study Area relevant to the Climate Change assessment (section 9.5).

vi. A description of mitigation measures included for the purposes of the Climate Change assessment reported within this PEI Report (section 9.6). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**.

vii. The likely Climate Change effects arising during construction and operation of the Project, based upon the assessment completed to date (section 9.7).

viii. An outline of the proposed monitoring requirements in relation to Climate Change.

9.1.2 This chapter specifically addresses two separate aspects of the Climate Change assessment:

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 the time of undertaking the assessment for the PEI Report, the early design stage meant that the level of design information available did not allow any calculation of likely GHG emissions. Therefore, it has not been possible to undertake the assessment of significance in line with the Institute of Environmental

Management and Assessment (IEMA) guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance (Ref 1). Instead, a qualitative appraisal of likely significance has been undertaken in this chapter and emissions hotspots have been identified in order to feed into the ongoing design to avoid and reduce expected emissions from construction and operation of the Project. The full GHG assessment to be reported in the Environmental Statement (ES) will include a 'bottom up' calculation[1] the GHG emissions anticipated to be generated or avoided by the Project.

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. In line with the relevant IEMA guidance on ICCI assessment (Ref 2), the assessment 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. At PEI Report stage, just the assessment methodology for the proposed ICCI assessment is set out. The Climate Change chapter of the Grimsby to Walpole Environmental Impact Assessment (EIA) Scoping Report (Ref 3) proposed to scope out a standalone ICCI assessment in the ES and instead, each environmental chapter would take account of projected future climate change within their future baseline. However, for simplicity and to avoid excessive repetition across ES chapters, the ICCI assessment will now be reported within the Climate Change chapter of the ES and not within the individual topic chapters.

9.1.3 Further to the Climate Change Resilience (CCR) Screening Assessment, which is reported in Appendix 18A of the Grimsby to Walpole EIA Scoping Report (Ref 3), it is agreed with the Planning Inspectorate that provided all design and control measures identified in the CCR are demonstrably secured, no further assessment of the Project's vulnerability to climate change is required in the ES.

9.1.4 Further supporting information is set out in **Table 9.1** below, including supporting chapters and technical appendices.

Table 9.1 Supporting documentation

Supporting Information	Description
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the EIA approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	Provides an overarching description of the Project and its key components, including available construction information.

[1] A 'bottom up' calculation collates and analyses all materials and activities to be completed to deliver the Project.

Supporting Information	Description
PEI Report Volume 3 Part A Appendix 2A Key Legislation	Provides a list of identified environmental legislation considered relevant to the Project**,** which will be updated and amended as required to inform of the ES.
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-Wide	Details planning policies applicable route-wide within the relevant local authority areas.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted consent.

9.1.5 There are interrelationships between the potential effects on Climate Change and other environmental topics. Although not relevant at PEI Report stage due to the qualitative nature of the assessment, at the point of undertaking the full GHG assessment at ES stage, there may be interrelationships with the following environmental topics:

i. **Traffic and Movement** – GHG calculations in the ES may use outputs from the traffic and transport assessment;

ii. **Air Quality** - there are some links between GHG emissions and air quality, and the Air Quality assessment within the ES may share some outputs with the GHG assessment; and

iii. **Ecology and Biodiversity** - outputs from the Biodiversity Net Gain (BNG) assessment will be used in the land use GHG assessment within the ES.

9.2 Legislation and Policy Framework

9.2.1 Legislation and policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Legislative, Regulatory and Planning Policy Context**, and supporting appendices, the details of which are set out in **Table 9.1**.

Regional and Local Policy

9.2.2 Regional and local plans or policies relevant to this assessment are as follows:

i. North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018) (Ref 4) Policy 31 Renewable and low carbon infrastructure, Policy 32 Energy and low carbon living and Policy SO2 Climate change.

- Policy 31 states that the Council aims to achieve at least 75 MW of grid-connected renewable energy by 2032 and supports renewable and low-carbon energy proposals if significant adverse impacts are minimised and public benefits outweigh any remaining harm.

- Policy 32 states that development should follow the energy hierarchy for energy efficiency and low carbon outcomes. Major development applications must include Design and Access Statements demonstrating consideration of: Landform, layout, building orientation, massing, and landscaping; use of materials concerning embodied carbon and energy efficiency; and minimisation of waste and reuse of materials from excavation and demolition.
- Policy SO2 aims to address climate change by promoting development that minimises natural resource and energy use, reduces waste and encourages recycling, reduces pollution, promotes sustainable transport use, responds to increasing flood risk, and incorporates sustainable construction practices. It also emphasises the importance of green infrastructure in mitigating flood risk and recognises the stress that climate change places on habitats and species. .

ii. East Lindsey Local Plan Core Strategy (Adopted July 2018) (Ref 5) Policy SP27: Renewable and low carbon energy. SP27 states that large-scale renewable and low carbon energy developments will be supported if their individual or cumulative impacts are deemed acceptable compared to their benefits.

iii. Central Lincolnshire Local Plan (Adopted April 2023) (Ref 6) Policy S11: Embodied Carbon, Policy S14: Renewable Energy and Policy S17: Carbon Sinks;

- S11 encourages development proposals to take opportunities to reduce the development's embodied carbon content, through the careful choice, use and sourcing of materials. With all major development proposals setting out what opportunities to lower a building's embodied carbon content have been considered.
- S14 notes that support will be given to proposals which are necessary for, or form part of, the transition to a net zero carbon sub-region, including: upgraded or new electricity facilities (such as transmission facilities, substations or other electricity infrastructure).
- S17 notes that existing carbon sinks must be protected and enhanced where possible and sets out the Council's requirement for an evaluation and management plan where a carbon sink may be impacted by a development.

iv. South East Lincolnshire Local Plan 2011-2036 (Adopted March 2019) (Ref 7) Policy 31: Climate Change and Renewable and Low Carbon Energy;

- Policy 31 requires that all development proposals will be required to demonstrate that the consequences of current climate change has been addressed, minimised and mitigated. Proposals by a local community for the development of renewable and low carbon sources of energy, in scale with their community's requirements, including supporting infrastructure for renewable energy projects, will be supported and considered in the context of contributing to the achievement of sustainable development and meeting the challenge of climate change.

v. Fenland Local Plan (Adopted May 2014) (Ref 8) Policy LP14: Responding to Climate Change and Managing the Risk of Flooding in Fenland; and

- LP14 Part A: Renewable Energy: Renewable energy proposals will be supported and considered in the context of sustainable development and

climate change. Development proposals will, through Building Regulations or other regulations, need to meet all or the majority of their required reduction of carbon emissions on-site. Where these cannot be fully met on-site, and where a lawful mechanism exists to do so, the Council will be prepared to accept, as an 'allowable solution', a financial contribution to make up the difference.

vi. Norfolk County Council Climate Strategy (May 2023), Focus Area 3 (Addressing Norfolk's county-wide emissions), Thematic Area – Energy (Ref 9). Thematic Area – 'Energy' aims to promote a whole-systems approach to transforming the energy system, focusing on transmission and distribution of energy across Norfolk and supporting green energy generation. The Project directly contributes to this identified Thematic Area.

9.2.3 For further detail please refer to **PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy** and **PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-Wide.**

9.3 Scope of Assessment

9.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 10) provided by the Planning Inspectorate on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 3). A summary of the Scoping Opinion together with a response against each point of relevance to the Climate Change chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.

9.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.

9.3.3 As noted in section 9.1, the high-level scope of the Climate Change assessment covers two separate aspects:

i. **the 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; and

ii. **the 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.

9.4 Assessment Methodology

9.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Climate Change assessment are set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This includes a description of how receptor sensitivity, magnitude of impact and significance of effects are all defined and assigned to the assessment. A summary of the key components are outlined below.

GHG Assessment

9.4.2 Relevant guidance and standards that have informed the assessment methodology and qualitative appraisal presented within the PEI Report are listed below:

i. IEMA (2022) Assessing Greenhouse Gas Emissions and Evaluating their Significance (Ref 1); and

ii. The Publicly Available Specification 2080 (PAS 2080:2023) on carbon management in Buildings and Infrastructure, a global standard for managing whole life carbon in the built environment and associated PAS 2080 Guidance Document (Ref 11).

9.4.3 The following further guidance is considered likely to be relevant to inform the full 'bottom up' calculation of GHG emissions for the full GHG assessment, to be undertaken and reported within the ES:

i. The Greenhouse Gas Protocol (Ref 12) - GHG Protocol establishes comprehensive global standardised frameworks to measure and manage GHG emissions from private and public sector operations, value chains and mitigation actions.

ii. Department for Energy Security and Net Zero Emission Conversion Factors 2023 (Ref 13).

iii. Royal Institution of Chartered Surveyors (RICS) Whole life carbon assessment for the built environment (2024) (Ref 14). This standard addresses all element and component categories that make up a built asset, across every life cycle stage: from extracting the raw materials and manufacturing construction products, through construction and operation, to recovery or disposal at end of life. It also separately assesses the potential loads and benefits beyond the system boundary in the next life cycle.

9.4.4 The current assessment presented in this PEI Report is preliminary and is likely to be subject to change as more detailed data becomes available. Additionally, the design will also be subject to further refinement prior to submission of the ES.

ICCI Assessment

9.4.5 The relevant guidance and standards that will be taken into account as part of the ICCI assessment to be reported in the ES includes the IEMA (2020) Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation (Ref 2).

9.5 Assessment Assumptions and Limitations

9.5.1 The following limitations and assumptions have been identified for this PEI Report stage, with further details provided in **PEI Report Volume 3 Part A Appendix 4B EIA Technical Assessment Methodologies and Scope**:

i. For the GHG assessment:

- At this early design stage (PEI Report stage) design information is insufficient to allow any calculation of likely emissions and therefore it is not possible to undertake the assessment of significance in line with the IEMA guidance (Ref 1). Instead, a qualitative appraisal of likely significance has been undertaken at PEI Report stage and emissions hotspots have been identified in order to feed into the ongoing design to avoid and reduce expected emissions from construction and operation.

ii. For the ICCI assessment:

- As noted above, the ICCI assessment will be undertaken after the likely effects to be reported in the Climate Change chapter of the ES have been identified by each environmental discipline. Assumptions and limitations will be defined at the point of undertaking the assessment and reported in the ES.

9.5.2 These key parameters and assumptions will be reviewed based on the design presented in the Development Consent Order (DCO) application and, where required, updated, or refined, for the ES. The ES will present the final key limitations and assumptions used within that assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

9.6 Baseline Conditions

Study Area

GHG assessment

9.6.1 The Study Area for the GHG assessment includes the whole spatial extent of the Project (therefore including all seven Sections of the Project route described in **PEI Report Volume 3 Part A Chapter 5 Project Description** and demonstrated in **PEI Report Volume 2 Part A Figure 1.1 Draft Order Limits and Refined Weston Marsh Substation Siting Zone**.

9.6.2 The scope for the GHG assessment includes all material sources and removals of GHG emissions arising from pre-construction, construction, operation and maintenance of the Project. The scope of emissions sources and removals are detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

ICCI assessment

9.6.3 The Study Area for the ICCI assessment to be reported in the ES will be defined by the Study Areas contained within the methodology sections in each respective environmental discipline chapter of the ES.

Data Collection

GHG assessment

9.6.4 The following data has been used to inform the assessment of the baseline conditions:

i. peaty soils location (England) British Geological Society (BGS) & National Soil Resources Institute (NSRI) (Ref 15).

9.6.5 At the time of undertaking the assessment for the PEI Report, the early design stage meant that the following data were not available but this data will be included within the ES:

i. data on land use change, including existing and proposed land use within areas expected to change as a result of the Project; and

ii. high level Bill of Quantities[2] and activity data relating to the construction of the Project.

ICCI assessment

9.6.6 The following data will be used to inform the existing and future climate change projections (the baseline conditions) for the ICCI assessment to be reported within the ES:

i. UK Climate Projections (UKCP18) – regional (UKCP18 Regional (12 km) models) (Ref 16), probabilistic projections and factsheets. UKCP18 is the latest projections dataset for the UK, produced by the UK Met Office.

ii. HadUK-Grid Met Office (Ref 17) – HadUK-Grid is an observational gridded dataset produced by the UK Met Office. The gridded data sets are based on the archive of UK weather observations held at the Met Office.

iii. United Kingdom Climate Risk Indicators data – provides information on future change to indicators of climate risks across the UK, including wildfire daily hazard assessment data which provides a five-day summary for wildfire that could affect the UK, based on UKCP18 projections (Ref 18).

Existing Baseline

GHG assessment

9.6.7 The following section outlines the Climate Change baseline.

9.6.8 Aligning with IEMA (2022) guidance (Ref 1), the baseline (Do-Minimum scenario) is the reference against which the impact of the Project will be compared and assessed. The Do-Minimum scenario comprises the existing GHG emissions within the assessment scope (outlined in section 9.4) without implementation of the Project (the existing situation where the Project is not implemented). Assumptions are made on the projected cumulative GHG emissions over the study period [3] under this Do-Minimum scenario.

9.6.9 In terms of land use, the draft Order Limits and Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) comprise predominately arable land, managed 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. However, If drained and degraded, they can emit significant amounts of greenhouse gases. The condition of the peatland is not currently known, but peatlands in the UK and around the world are estimated to be a net source of GHG emissions to the atmosphere, as opposed to a net sink, due to the way they have

[2] A list of materials and services required to deliver a project. The list typically includes materials, labour, and quantities of each

[3] The study period will include the anticipated construction over a four year period from 2029-2033 and the assumed initial design life of 80 years (2024 -2104).

been managed now and in the past. Development within peatlands should be avoided or minimised wherever possible irrespective of the existing condition and whether the peatland is an existing carbon source or carbon sink. Peatlands should be preserved wherever possible. At the time of writing this PEI Report, the existing baseline is considered as zero GHG emissions, being a worst realistic case for comparison using a precautionary approach.

9.6.10 The baseline may be updated for the ES when more information is available on the condition of the peatland and on the land uses that will likely be subject to change as a result of the Project. For example, if further disturbance or removal of existing woodland through construction of the Project were proposed, this would release previously sequestered GHG emissions and therefore would need to be scoped in to the assessment.

ICCI assessment

9.6.11 Existing baseline climate conditions will be reported within the baseline section of the Climate Change chapter of the ES, where the outcome of the ICCI assessment will be reported.

Future Baseline

9.6.12 The future baseline relates to known or foreseeable changes to the current baseline in the future, against which the effects of the Project during construction and operation are assessed. Specifically, it accounts for anticipated changes including: those caused by changing climatic conditions, policy, legislation, advances in technology and by other confirmed development projects which will be complete prior to construction of the Project.

9.6.13 At this preliminary stage, a full assessment of the implications of any confirmed development projects with regard to future baseline conditions has not been undertaken. A list of the currently known developments which are anticipated to be included within the future baseline scenario is provided within **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information Annex I Developments for Consideration Within the Future Baseline**. This will be reviewed and updated as appropriate during development of the ES, as with other information which informs assessment of the future baseline.

GHG assessment

9.6.14 The future baseline for the assessment of the impact of the Project on climate takes account of emissions caused by not implementing the Project (the ‘Baseline’ as described above). Any changes to existing land use will be considered within the future baseline within the ES. For the PEI Report, it is assumed that the existing land use identified in the draft Order Limits and Refined Siting Zone continues and no other projects/schemes are developed, therefore the future baseline includes operational emissions and land use emissions/removals associated with land use activities over the study period, which at the time of writing this PEI Report are considered as zero GHG emissions being a worst realistic case analysis using a precautionary approach. The baseline may be updated for the ES when more detailed information is available on the land uses that will likely be subject to change as a result of the Project.

9.6.15 The Project forms part of the Great Grid Upgrade (GGU) (for further details on the GGU, please refer to **PEI Report Volume 2 Part A Chapter 1 Introduction**) and without the GGU, there would be significant delays to decarbonising the electricity sector. Although it is not feasible to quantify accurately, the constraints on the transmission network are increasing as electricity demand continues to rise and increasing levels of electricity generation are provided by renewable energy sources; this factor is essential to consider. Without delivery of the Project, the available capacity on the existing transmission network would be insufficient to accommodate the connection of proposed renewable power sources to meet the projected increased electricity demand. The Project will provide a significant increase in network capacity for renewable energy generation and will reduce constraints on existing renewable generation, significantly reducing emissions compared to not delivering the Project. While the likely effect in the absence of the Project would be expected higher GHG emissions in the future, quantifying these would rely on speculation beyond the reasonable limits of this assessment.

ICCI assessment

9.6.16 The future climate conditions will be provided within the future baseline section of the Climate Change chapter of the ES, where the outcome of the ICCI assessment will be reported.

9.7 Design, Control and Mitigation Measures

GHG Assessment

Design mitigation measures

9.7.1 The Project and draft Order Limits and Refined Siting Zone have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 19) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 20) which apply to design and siting of substations. These approaches are explained in further detail within the **Corridor Preliminary Routeing and Siting Study (CPRSS)** (Ref 21) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered**.

9.7.2 The Project has been routed in accordance with Holford Rule 3, specifically "Other things being equal, choose the most direct line, with no sharp changes of direction and thus with fewer angle towers" (Ref 19). The adoption of options with a reduced overall route length and fewer angle pylons is likely to lead to a reduction in the quantity of materials (and associated embodied carbon) required for construction.

9.7.3 At the Options Identification and Selection stage of the Project, the Strategic Options Appraisal, reported in the North Humber to High Marnham and Grimsby to Walpole Strategic Options Report[4] (Ref 22), considered the relative lengths of overhead line and underground cable lengths. The selection of overhead line for the Project, rather

[4] The Strategic Option Report explains the strategic options considered to deliver the necessary network upgrade.

than underground cables, has a beneficial effect on GHG emissions associated with use of materials, construction, maintenance, repair and future upgrading/uprating[5].

9.7.4 At the routing and siting stage of the Project[6], reported in the Corridor Preliminary Routeing and Siting study (CPRSS) (Ref 21), a high-level carbon cost exercise was undertaken across options, which adopted the high-level assumption that a longer construction duration[7] and/or a greater extent of infrastructure would be associated with a higher carbon impact. The adoption of significant lengths of underground cables within the design would have significantly extended the construction programme, which would have had a higher carbon impact from a construction perspective.

9.7.5 At the routing and siting stage of the Project, consideration was also given to the presence of peaty soils as a weighted element, with a preference to avoid where possible. Ecosystems like peatlands are capable of absorbing and storing large amounts of carbon dioxide and if in good health, can hold vast stores of carbon in the ground. Disturbance through development would be likely to release these stored emissions into the atmosphere and so avoiding development within these areas would avoid release of these stored GHG emissions.

9.7.6 The detailed design process for the Project will be iterative and shall seek to minimise GHG emissions associated with the design, construction and operation/maintenance of the Project.

9.7.7 The Project will consider implementing the following design mitigation measures:

i. Circular economy principles[8] will be considered at the detailed design stage with the intention to implement measures to design out waste and integrate circular economy principles which will include consideration of pre-construction, construction, operation and end-of-life processes and materials would be selected to minimise waste over the whole lifecycle of the Project. More information can be found in **PEI Report Volume 2 Part A Chapter 5 Project Description** under 'Approach to materials and waste'.

ii. The Project will consider a range of measures to reduce energy consumption (and associated emissions) during both construction and/or operation, as set out in **PEI Report Volume 2 Part A Chapter 5 Project Description** under 'Approach to energy consumption'.

iii. The Project will, where reasonably practical, maximise the potential for reuse of material recovered from site. Alternatively, near-site sources of material will be identified to minimise transportation and ground treatment emissions.

[5] There are multiple sustainability advantages of overhead lines compared to underground cables for equivalent power ratings at 400 kV. Land disruption is greater when laying underground cables than when erecting overhead line towers. The volume of spoil excavated for an underground cable is many times greater than for an equivalent overhead line route. Significant vegetation also has to be cleared along and to the side of trenches to allow for construction and associated access, all of which have implications for carbon in comparison to an overhead line.

[6] The routeing and siting options are assessed and preferred options are presented in the CPRSS.

[7] A longer construction duration was assumed to have a higher carbon impact due to resultant delays in renewable energy being connected to the grid.

[8] 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.

iv. The Project will, where reasonably practical, endeavour to use materials with the highest recycled content, where this leads to lower whole life GHG emissions and encourage their use through procurement exercises.

v. The Project will continue to integrate carbon as a weighted element within the design and decision-making process and, as part of the GGU, work with partners across the industry on lower carbon alternatives.

vi. The Project will, where reasonably practical, consider lower carbon options for goods transportation, for example through considering alternative options to Heavy Goods Vehicle (HGVs) delivery to the site and alternative fuel vehicles.

vii. Peaty soils are present within the overhead line corridor. Where there are small, scattered pockets of peaty soils present only, the Project will seek to avoid or oversail these areas wherever practicable.

Control mitigation measures

9.7.8 A Preliminary Code of Construction Practice (CoCP) is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. The control measures included within the Preliminary CoCP relevant to the GHG assessment include:

i. CC01: The Main Works Contractor will develop and implement a Carbon Efficiency Plan as part of their Environmental Management System, to manage carbon emissions from construction activities. This will contain:

- proposed measures to reduce significant sources of construction energy use (fuel/electricity) and associated emissions;
- the approach to securing energy from renewable and/or zero or low emission sources;
- the approach to energy and carbon dioxide reporting from relevant site activities including construction activities and the transportation of materials and waste; and
- consideration of the procurement, maintenance and use of energy and carbon efficient construction plant.

ii. CC02: Mitigation measures set out within the Carbon Efficiency Plan will include:

- a commitment to reduce GHG emissions as far as reasonably practical by implementing low carbon and/or reduced resource consumption solutions (including technologies, materials and products) to minimise resource consumption during the construction, operation and at end of life.
- the design of the Project should minimise the requirement for energy consuming operational equipment such as lighting as far as reasonable practicable. Where lighting cannot be avoided, it will be of the lowest luminosity necessary to safely perform tasks.
- the specification of materials with fewer embodied GHG emissions within the Main Works Contractor's contracts (e.g. where practical, sustainable materials ((materials with a higher recycled content)) and locally sourced materials should be selected), including where feasible, design for end of component reuse;

- use of renewable/zero or low carbon energy sources for construction vehicles, plant and machinery where reasonably practicable, e.g. electric vehicles and plant.
- efficient use of construction plant and machinery i.e. using appropriately sized plant and machinery, and switching off when not in use.
- fuel use monitoring.
- employing low carbon construction techniques as far as reasonably practicable.
- plant and machinery to be kept in good working order to maintain power efficiency.
- sufficient training for operatives to use machinery and plant efficiently.
- using appropriate size generators for plant and any temporary buildings etc
- nominating named individuals with responsibility for minimising energy use on-site.
- commitments to recycle/reuse demolition waste wherever reasonably practicable.
- commitments to reduce water use and disposal.
- provision of suitable thermal insulation for site accommodation to minimise energy demand for heating.
- early connection to grid electricity to reduce use of mobile diesel energy generation, where reasonably practicable.
- efficient transportation of construction materials and waste transport, with the aim to use electric vehicles wherever practicable.
- sourcing construction materials from local suppliers where practicable to reduce transport emissions.
- promotion and provision of modes of sustainable transport for construction workers.
- material excavated during construction of the Project should be processed for use in the works wherever practicable, to reduce the amount of material disposed of off-site as well as imported from other sources.
- the Project design should carefully consider the use of appropriate tree and shrub species to reduce associated maintenance operations.
- once operational, asset data should be managed, maintained and monitored to ensure the Project design is operating as intended. Corrective action to be taken where necessary.

iii. LV01: The contractor(s) will retain vegetation where practicable. Where vegetation is lost and trees cannot be replaced in situ due to the restrictions associated with land rights required for operational safety, native shrub planting approved by National Grid will be used as a replacement, in accordance with the outline vegetation reinstatement plans included within the Landscape

Environmental Management Plan (LEMP)[9]. Replacement vegetation will be planted as close by as practicable and will complement landscape character and be sympathetic to the local habitat type in order to provide a high biodiversity value.

iv. LV03: A five-year aftercare period will be established for all reinstatement and mitigation planting, details of which will be set out in the LEMP.

v. GG26: If peaty soils are disturbed during construction of the Project, reinstatement would be required following construction to ensure the peat is returned to its previous health.

Additional mitigation and enhancement

9.7.9 Additional mitigation measures are those required to reduce likely significant adverse environmental effects which may still occur despite the inclusion of the embedded design and control measures described above.

9.7.10 At this stage, it is not thought that any additional mitigation measures would be required over and above the embedded design and control measures outlined above. As stated, the Project will continue to integrate carbon as a weighted element within the design and decision-making process and continue to work across the industry on lower carbon alternatives.

ICCI Assessment

9.7.11 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.

9.8 Preliminary Assessment of Effects

GHG Assessment

9.8.1 As noted in section 9.1, at the time of undertaking the assessment for the PEI Report, the early design stage meant that the level of design information available did not allow any calculation of likely GHG emissions and therefore it has not been possible to undertake the assessment of significance in line with the IEMA guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance (Ref 1). Instead, this section presents a preliminary qualitative appraisal of likely significance and identifies the GHG emissions hotspots that are likely to arise as a result of construction, maintenance and/or operational activities associated with the Project and therefore the areas to target further design changes prior to ES submission and post DCO application to avoid or reduce associated GHG emissions.

9.8.2 It is noted that this is an ongoing assessment and is subject to changes due to the ongoing development of the Project. A full assessment, including a ‘bottom up’ calculation of GHG emissions anticipated to be generated or avoided by the Project, will be included within the ES submitted with the DCO application.

[9] that will be produced and secured as part of the DCO.

Construction and operation

9.8.3 As outlined within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**, the global atmosphere is the receptor for the purposes of the GHG assessment and all net emissions of GHGs to the atmosphere will contribute to climate change. GHG emissions released into the atmosphere contribute to global warming by absorbing heat that would otherwise be radiated into space. The sensitivity of the global atmosphere to GHG emissions is high.

9.8.4 The embedded design/control and mitigation measures identified at this early stage to avoid and reduce GHG emissions over the Project lifecycle are set out in section 9.7. The Project will continue to integrate carbon as a weighted element within the design and decision-making process.

9.8.5 At the time of undertaking the assessment for the PEI Report, the early design stage meant that the level of design information available did not allow any 'bottom up' calculation of the likely GHG emissions anticipated to be generated or avoided by the Project, and therefore it has not been possible to undertake the assessment of significance in line with the IEMA guidance on Assessing Greenhouse Gas Emissions and Evaluating their Significance (Ref 1) at this stage.

9.8.6 It is, however, possible to qualitatively assess the Project against the tests for significance. **Table 9.2** provides a qualitative appraisal against the IEMA guidance on significance principles and criteria for each effect category.

9.8.7 The Project is an essential component of the GGU, which has been identified as a key part of the UK's transition to net zero emissions by 2050. The Project will facilitate greater use of low carbon 'clean' energy generation technologies which, in turn, will support the transition away from carbon intensive fossil fuel use for power generation. The absence of the Project would restrict the opportunity for such low carbon electricity to be conveyed to its point of use. Based on this overriding imperative for the Project, it is considered that emissions associated with its delivery and operation would be insignificant in comparison to the likely emissions arising from a scenario where the Project is not delivered.

Table 9.2 Qualitative appraisal against the IEMA guidance on significance principles and criteria (*IEMA Guide: Assessing Greenhouse Gas Emissions and Evaluating their Significance*)

Effects	Significance level	Description	Example in the IEMA guidance	Qualitative appraisal of the Project against the guidance
Significant adverse	Major or moderate adverse	A project that follows a 'business–as–usual' or 'do minimum' approach and is not compatible with the UK's net zero trajectory, or accepted aligned practice or area-based transition targets. It is down to the practitioner to differentiate between the 'level' of significant adverse effects e.g. 'moderate' or 'major' adverse effects.	The project's GHG impacts are not mitigated or are only compliant with do–minimum standards set through regulation, and do not provide further reductions required by existing local and national policy for projects of this type. A project with major adverse effects is locking in emissions and does not make a meaningful contribution to the UK's trajectory towards net zero.	The Project is compatible with the UK's net zero trajectory and is not considered to follow a 'business–as–usual' or 'do minimum' approach. It is considered that the Project would make a meaningful contribution to the UK's trajectory towards net zero.
Not significant	Minor adverse	A project that is compatible with the budgeted, science-based 1.5°C trajectory (in terms of rate of emissions reduction) and which complies with up–to–date policy and 'good practice' reduction measures to achieve that. It may have residual emissions but is doing enough to align with and contribute to the relevant transition scenario, keeping the UK on track towards net zero by 2050 with at least a 78 per cent reduction by 2035 and thereby potentially avoiding significant adverse effects.	The project's GHG impacts would be fully consistent with applicable existing and emerging policy requirements and good practice design standards for projects of this type. A project with minor adverse effects is fully in line with measures necessary to achieve the UK's trajectory towards net zero.	The Project is considered to be compatible with the budgeted, science-based 1.5°C trajectory. It is considered to align with and contribute to the relevant transition scenario, as described. The Project is considered to be in line with measures necessary to achieve the UK's trajectory towards net zero.

Effects	Significance level	Description	Example in the IEMA guidance	Qualitative appraisal of the Project against the guidance
Not significant	Negligible	A project that achieves emissions mitigation that goes substantially beyond the reduction trajectory, or substantially beyond existing and emerging policy compatible with that trajectory and has minimal residual emissions. This project is playing a part in achieving the rate of transition required by nationally set policy commitments.	The project's GHG impacts would be reduced through measures that go well beyond existing and emerging policy and design standards for projects of this type, such that radical decarbonisation or net zero is achieved well before 2050. A project with negligible effects provides GHG performance that is well 'ahead of the curve' for the trajectory towards net zero and has minimal residual emissions.	The Project is considered to be contributing to the UK's ability to achieve the rate of transition required by nationally set policy commitments. It is not possible at this stage to make a quantitative assessment of GHG emissions.
Significant beneficial	Beneficial	A project that causes GHG emissions to be avoided or removed from the atmosphere. Only projects that actively reverse (rather than only reduce) the risk of severe climate change can be judged as having a beneficial effect.	The project's net GHG impacts are below zero and it causes a reduction in atmospheric GHG concentration, whether directly or indirectly, compared to the without–project baseline. A project with beneficial effects substantially exceeds net zero requirements with a positive climate impact.	Whilst the Project, as part of the GGU, will facilitate a reduction in GHG emissions from non-renewable energy generation sources once the proposed renewable energy generation can connect to the reinforced network, there is no direct causal link between delivery of the Project and the avoidance of GHG emissions. The absence of the Project, however, would restrict the opportunity for low carbon 'clean' energy generation technologies and the transition away from carbon intensive fossil fuel use for power generation.

9.8.8 In the absence of data on GHG emissions, it is also useful to draw a comparison against the assessment outcomes of other National Grid Electricity Transmission plc (National Grid) projects also seeking to upgrade the existing electricity network, which may also give an indication as to whether the Project may give rise to a significant effect. Although the other electricity grid infrastructure projects identified in **Table 9.3** vary considerably in nature and scale from the Project, they are useful to provide a context for the assessment outcomes for other grid upgrade schemes.

Table 9.3 GHG assessment outcomes of comparable projects

Comparable Project	High level description	Outcome of GHG assessment
Yorkshire GREEN (DCO granted March 2024)	Provision of two new electricity substations (including 28 km of existing overhead lines reconducted and strengthened, 10 km of new overhead lines installed, 1 km of new underground cables installed and the construction of 33 new pylons).	The Project is assessed as having a minor (adverse) effect in line with IEMA guidance (Ref 1), as although the Project will increase GHG emissions, this is to a degree that will not affect the ability to meet UK carbon budgets, and therefore this effect is not considered to be significant.
Bramford to Twinstead (DCO granted September 2024)	The project consists of the following: • up to 18 km of new 400 kV overhead lines; • up to 11 km of new 400 kV underground cables; • four cable sealing end compounds to connect overhead line and underground cable sections together; • removal of around 25 km of existing 132 kV pylons; • removal of around 2 km of existing 400 kV pylons; and • a new grid supply point substation.	The project emissions are considered immaterial to the UK meeting its future carbon budget targets or its overall 2050 net zero target, therefore no significant effects are reported.

9.8.9 The likely principal sources (the most carbon intensive areas of the Project) of GHG emissions are outlined below and the Project will continue to work to avoid and reduce emissions giving specific priority to these sources:

i. The use of raw materials in the construction of the project and their installation processes, for example steel for pylons, concrete for the pylon foundations, aluminium for the conductors and stone and aggregate for access and substation platforms.

ii. Avoiding where possible or minimising the use of sulphur hexafluoride (SF6) in substation equipment such as circuit breakers. SF6 is a potent GHG, with a global warming potential 23,900 times greater than carbon dioxide.

ICCI Assessment

9.8.10 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.

9.9 Monitoring

GHG Assessment

9.9.1 The Main Works Contractor will develop and implement a Carbon Efficiency Plan, as part of their Environmental Management System, to manage GHG emissions from construction activities, which will be included in the CoCP which would be secured by a DCO Requirement. The Carbon Efficiency Plan will include monitoring of carbon emissions during construction and operation of the Project. Corrective action would be taken where necessary if the design is not operating as intended.

ICCI Assessment

9.9.2 Any additional monitoring requirements 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 any relevant monitoring plans and included in the CoCP which would be secured by a DCO Requirement.

References

Ref 1 Institute of Environmental Management and Assessment (2022). Assessing Greenhouse Gas Emissions and Evaluating their Significance, London: IEMA [online]. Available at: https://www.iema.net/media/xmgpoopk/2022_iema_greenhouse_gas_guidance_eia.pdf [Accessed 03 September 2024].

Ref 2 Institute of Environmental Management and Assessment (IEMA) (2020) 'Environmental Impact Assessment Guide to: Climate Change Resilience & Adaptation'. Available at: https://www.iema.net/content/iema-eia-guide-to-climate-change-resilience-and-adaptation-2020/

Ref 3 National Grid Electricity Transmission (2024). Grimsby to Walpole Environmental Impact Assessment Scoping Report [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000004-EN020036%20-%20Scoping%20Report%20Volume%201%20Main%20Report.pdf [Accessed 18 October 2024].

Ref 4 North East Lincolnshire Council (2018) North East Lincolnshire Local Plan 2013 to 2032 (Adopted 2018). [online] Available at: https://www.nelincs.gov.uk/assets/uploads/2018/05/20180518-AdoptedLocalPlan2018-WEB.pdf [Accessed 03 September 2024].

Ref 5 East Lindsey District Council (2018) East Lindsey Local Plan Core Strategy (Adopted July 2018). [online] Available at: https://www.e-lindsey.gov.uk/media/9791/Core-Strategy/pdf/Final_Version_of_Core_Strategy_2018.pdf?m=1546595473230 [Accessed 03 September 2024].

Ref 6 Central Lincolnshire Joint Strategic Planning Committee (2023) Central Lincolnshire Local Plan (Adopted April 2023). [online] Available at: https://www.n-kesteven.gov.uk/sites/default/files/2023-04/Local%20Plan%20for%20adoption%20Approved%20by%20Committee.pdf [Accessed 03 September 2024].

Ref 7 South East Lincolnshire Council (Adopted March 2019) South East Lincolnshire Local Plan 2011-2036 Policy 31: Climate Change and Renewable and Low Carbon Energy. Available at: https://southeastlincslocalplan.org/article/20102/Adopted-Plan [Accessed 03 September 2024].

Ref 8 Fenland District Council (2014) Fenland Local Plan (Adopted May 2014). [online] Available at: https://www.fenland.gov.uk/media/12064/Fenland-Local-Plan---Adopted-2014/pdf/Fenland_Local_Plan-Adopted_2014.pdf [Accessed 03 September 2024].

Ref 9 Norfolk County Council (2023) Climate Strategy: Focus Area 3 - Addressing Norfolk's County-wide Emissions, Thematic Area – Energy. Available at: https://www.norfolk.gov.uk/article/58016/Climate-action-plan

Ref 10 The Planning Inspectorate (2024). Scoping Opinion: Proposed Grimsby to Walpole Project [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000109-Scoping%20Opinion%202017%20EIA%20Regs.pdf [Accessed 18 October 2024].

Ref 11 British Standards Institution. (2023). PAS 2080:2023 Carbon management in buildings and infrastructure. Available at: https://www.nqa.com/en-gb/certification/standards/pas-2080?gad_source=1&gad_campaignid=22390067005&gclid=CjwKCAjw87XBBhBIEiwAxP3_A-P1LZkzatup4HMhUw9UrVpPrFwKp9kHWZ_gWrOShhMkweib2ohWsRoCYdAQAvD_BwE

Ref 12 World Resources Institute & World Business Council for Sustainable Development. (2004). The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard (Revised Edition). Available at: https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

Ref 13 Department for Energy Security and Net Zero (2023). Greenhouse gas reporting: conversion factors 2023. Available at: https://www.gov.uk/government/publications/greenhouse-gas-reporting-conversion-factors-2023

Ref 14 Royal Institution of Chartered Surveyors (RICS) (2024). Whole life carbon assessment for the built environment. Available at: https://www.rics.org/profession-standards/rics-standards-and-guidance/sector-standards/construction-standards/whole-life-carbon-assessment

Ref 15 British Geological Society and National Soil Resources Institute (2024) Peaty Soils Location. Available at: https://www.data.gov.uk/dataset/9d494f48-f0d7-4333-96f0-8b736ac8fb18/peaty-soils-location1

Ref 16 Met Office (2018). UKCP Probabilistic projections. [online] Available at: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/science/probabilistic-projections

Ref 17 Met Office (2018). HADUK Grid Overview. [online] Available at: https://www.metoffice.gov.uk/research/climate/maps-and-data/data/haduk-grid/haduk-grid [Accessed 14 May 2024].

Ref 18 The UK Climate Resilience Programme (2024). Climate Risk Indicators. [online] Available at: https://uk-cri.org/ [Accessed 27 May 2024].

Ref 19 National Grid (1959) ‘The Holford Rules and Supplementary Guidance notes’. London: National Grid [online]. Available at: https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf [Accessed 06 September 2024].

Ref 20 National Grid (no date) Horlock Rules [online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf [Accessed 13 March 2025]

Ref 21 National Grid, January 2024, Grimsby to Walpole: Corridor and Preliminary Routing and Siting Study. Available at: https://www.nationalgrid.com/document/352621/download [Accessed 20 September 2024].

Ref 22 National Grid, (May 2023), North Humber to High Marnham and Grimsby to Walpole: Strategic Options Report. Available at: https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/grimsby-to-walpole

10. Cumulative Effects

nationalgrid

Contents

10. Cumulative Effects

10.1 Introduction

10.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the cumulative effects assessment (CEA) of the Grimsby to Walpole Project (the Project). Specifically, the chapter includes the following sections:

i. An introduction to the topic (section 10.1).

ii. Identification of key local and regional policy relevant to the assessment (section 10.2). A full overview of the legislation and national, regional onshore and marine planning policy context that applies to the Project is presented within **PEI Report Volume 2 Part A Chapter 2 Legislation, Regulatory and Planning Policy Context** and supporting appendices.

iii. A summary of the assessment scoping process and the subsequent scope of the CEA (section 10.3). Further details are provided within **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.

iv. A high-level summary of the methodology of the CEA (section 10.4). A detailed description of the assessment methods and scope, applicable to the whole Project, is contained in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** and **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**.

v. A preliminary assessment of the potential intra-project cumulative effects identified as a result of the Project (section 10.5).

vi. A preliminary assessment of the potential inter-project cumulative effects identified as a result of the Project (section 10.6).

vii. A description of mitigation measures included for the purposes of the CEA reported within the PEI Report (section 10.7). Further information regarding design development can be found in **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered** and the **Grimsby to Walpole Design Development Report**.

10.1.2 Cumulative effects are the result of multiple actions on environmental receptors or resources. The CEA of the Project will consider the following types of effect:

i. Intra-project cumulative effects (sometimes referred to as combined or interactive effects): these effects occur where a single receptor is affected by more than one source of effect from the Project.

ii. Inter-project cumulative effects: these effects occur where a single receptor is affected by effects from a number of developments, including the Project. This includes effects which individually might not be of significance, but when considered together could create a significant cumulative effect on a shared receptor when considered together with the Project.

10.1.3 The assessment presented in this chapter draws on the assessment of impacts undertaken within the **PEI Report Volume 2 Part B** (Chapters 2 – 12) and **Part C** (Chapters 2 – 9) topic specific assessments for each Section of the Project. This chapter and supporting appendices also provide details of Committed Developments[1] within the vicinity of the Project that may be of relevance to the CEA, using information that is available within the public domain. This includes information relating to Nationally Significant Infrastructure Projects, local plan allocations, Marine License Applications and proposed schemes that have planning applications registered with the local planning authorities and/or already consented developments that have not yet been constructed.

10.1.4 The CEA does not consider developments that are already constructed and operating or assumed to be constructed and operating prior to the indicative construction programme for the Project (i.e. developments identified where construction is known to have already started). This assumption has been applied where construction is known to have started on a Committed Development. As such, developments that could feasibly be constructed and operating prior to the construction of the Project are detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration Within the Future Baseline.** The consideration of these developments will form part of the baseline conditions of each topic assessment as part of the production of the Environmental Statement (ES) within the future baseline.

10.1.5 Further supporting information is set out in **Table 10.1** below, including supporting figures and technical appendices.

[1] For the purposes of this chapter, the term 'Committed Development' refers to a development identified in the initial long list search which meets the definition of a Tier 1, 2 or 3 development as defined in the Planning Inspectorate's Advice on Cumulative Effects Assessment (Ref 3).

Table 10.1 Supporting documentation

Supporting Information	Description
Topic Specific Supporting Documentation	
PEI Report Volume 2 Part C Figures	**Figure 10.1: Zones of Influence for Cumulative Effects Assessment** **Figure 10.2: Long List of Committed Developments** **Figure 10.3: Shortlist of Committed Developments**
PEI Report Volume 3 Part C Appendix 10A Cumulative Effects Assessment Long List of Committed Developments	This appendix details the Committed Developments identified within a 10 km radius of the Project.
PEI Report Volume 3 Part C Appendix 10B Cumulative Effects Assessment Shortlist of Committed Developments	This appendix details the Committed Developments that have been shortlisted for a full CEA.
Project Supporting Documentation	
PEI Report Volume 3 Part A Appendix 2A Key Legislation	A list of identified environmental legislation considered relevant to the Project, which will be updated and amended as required to inform the ES.
PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
PEI Report Volume 3 Part B Appendix 2Ci Local Plan Policy: Section Specific	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
PEI Report Volume 3 Part B Appendix 2Cii Local Plan Policy: Route-wide	Details of planning policies applicable route-wide within the relevant Local Authority areas.
PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered	Provides a summary of the main alternatives considered in relation to the Project during the design development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
PEI Report Volume 2 Part A Chapter 5 Project Description	An overarching description of the Project and its key components, including available construction information.
PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice	Sets out control and management measures that will be undertaken during construction of the Project if granted

Supporting Information	Description
	consent. The final CoCP will be submitted in support of the Development Consent Order (DCO) application.

10.1.6 By virtue of the nature of a CEA, this assessment has interrelationships with all other environmental topics. For further information on receptors identified in those specific assessments, please refer to the respective **PEI Report Volume 2 Part B** and **Part C** chapters.

10.2 Legislation and Policy Framework

Legislation and National Policy

10.2.1 Legislation and national policy relevant to the Project and this chapter is described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, as well as **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**, detail of which is set out in **Table 10.1**.

Regional and Local Policy

10.2.2 No specific regional or local policies which directly make reference to cumulative effects have been identified for the purposes of this assessment. However, the need for the consideration of cumulative effects is well founded in regional and local planning policy, with many policies highlighting the inherent need to consider cumulative effects when assessing the potential impact of a development. The regional and local plans or policies that make reference to this are as follows:

i. North East Lincolnshire Local Plan 2013 to 2032 – Policy 31 Renewable and low carbon infrastructure;

ii. North East Lincolnshire Local Plan Review – Draft Strategic Policy 7 Renewable and low carbon infrastructure;

iii. North East Lincolnshire Local Plan Review – Draft Strategic Policy 11 Biodiversity and Geodiversity;

iv. East Lindsey Local Plan Core Strategy – Strategic Policy 27: Renewable and Low Carbon Energy;

v. Central Lincolnshire Local Plan – Policy S14: Renewable Energy;

vi. South East Lincolnshire Local Plan 2011 – 2036 – Policy 31: Climate Change and Renewable and Low Carbon Energy;

vii. Fenland Local Plan – Policy LP14: Responding to Climate Change and Managing the Risk of Flooding in Fenland;

viii. Fenland Local Plan 2021 – 2040 Draft Local Plan Consultation – Policy LP6: Renewable and Low Carbon Energy Infrastructure;

ix. King's Lynn and West Norfolk Site Allocations and Development Management Policies (SADMP) – Policy DM 20: Renewable Energy; and

x. King's Lynn and West Norfolk Local Plan Review 2019 – LP21: Renewable Energy Policy.

10.3 Scope of Assessment

10.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 1) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 2). The scope has also been informed through consultation and engagement with relevant consultees. A summary of the Scoping Opinion together with a response against each point of relevance to the cumulative effects chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**. A summary of the stakeholder engagement undertaken to date is provided in **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement**.

10.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Non-Statutory Consultation Feedback Report**.

10.3.3 The scope of the CEA covers the receptor groups identified in the Part B and Part C specialist topic assessments, either for interactions between different discipline topics in respect of the Project (intra-project) or for interactions between the Project and other Committed Developments (inter-project).

10.4 Assessment Methodology

10.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the CEA are set out in **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**. This includes a description of the approach to identifying intra-project and inter-project cumulative effects and how the long list of Committed Developments has been established.

10.4.2 The Planning Inspectorate's Advice on Cumulative Effects Assessment (Ref 3) has been used to inform the assessment methodology for cumulative effects.

Assessment Assumptions and Limitations

10.4.3 All general assumptions and limitations for the topic are listed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope.**

10.4.4 Topic specific assumptions and limitations are listed within **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**.

10.4.5 The assumptions and limitations of the CEA in regard to both intra-project and inter-project cumulative effects will be reviewed and updated as part of the ES.

10.5 Preliminary Assessment of Intra-Project Cumulative Effects

10.5.1 Intra-project cumulative effects (sometimes referred to as combined or interactive effects) occur where a single receptor is affected by more than one source of effect or aspect of the Project. An example of an intra-project effect would be where a local community is affected by dust, noise, and traffic disruption during the construction of

the Project, with the result being a greater level of nuisance than each individual effect alone.

10.5.2 A useful summary of the principle of cumulative intra-project effects is provided by the Planning Inspectorate in Advice Note Nine: Rochdale Envelope (Ref 4).

> *'The ES should not be a series of separate unrelated topic reports. The interrelationship between aspects of the proposed development should be assessed and careful consideration should be given by the developer to explain how interrelationships have been assessed in order to address the environmental impacts of the proposal as a whole. It need not necessarily follow that the maximum adverse impact in terms of any one topic impact would automatically result in the maximum potential impact when a number of topic impacts are considered collectively. In addition, individual impacts may not be significant but could become significant when their interrelationship is assessed. It will be for the developer to demonstrate that the likely significant impacts of the project have been properly assessed'.*

10.5.3 As set out within **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**, a three-stage approach has been adopted for the assessment of intra-project cumulative effects. The three stages are outlined below:

i. a pre-screening exercise to determine whether a receptor is exposed to more than one type of effect;

ii. a screening exercise to identify the level of effects on each receptor; and

iii. the main intra-project assessment which will consider if the combination of effects is likely to lead to overall effects of greater significance.

10.5.4 As this PEI Report is presenting a preliminary assessment and some of the topics have not been able to confirm the level of effect, an assessment of intra– project cumulative effects is not presented, as it is not possible to progress this assessment past stage one.

10.5.5 A full assessment of intra–project cumulative effects following the three-stage approach set out in **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology** will be conducted and presented in the ES.

10.5.6 The initial pre-screening assessment is presented in **Table 10.2** showing how the receptor groups are likely to interact between topics. This will be revisited as part of the ES to ensure all receptors considered within the ES are taken through this pre-screening assessment.

Table 10.2 Intra-project cumulative effects pre-screening assessment

	Environmental Topic										
	L	**V**	**E&B**	**HE**	**WE**	**G&H**	**A&S**	**T&M**	**N&V**	**SE**	**AQ**
L		X	X	X				X	X	X	
V	X		X	X				X	X	X	
E&B	X	X			X	X	X		X		X
HE	X	X							X		
WE			X			X					
G&H			X		X		X				
A&S	X		X			X					
T&M	X	X							X	X	X
N&V	X	X	X	X				X		X	X
SE	X	X						X	X		X
AQ			X					X	X	X	X

Note: green cells with an X indicate a potential intra-project cumulative effect

Acronyms used above: L: Landscape, V: Visual, E&B: Ecology and Biodiversity, HE: Historic Environment, WE: Water Environment and Flood Risk, G&H: Geology and Hydrogeology, A&S: Agriculture and Soils, T&M: Traffic and Movement, N&V: Noise and Vibration, S-E: Socio-economics, Recreation and Tourism, AQ: Air Quality

10.6 Preliminary Assessment of Inter-Project Cumulative Effects

10.6.1 Inter-project cumulative effects have the potential to occur when a Committed Development is situated within a certain radius of the Project. However, the nature of an impact pathway from the Project and the distance at which an inter-project cumulative effect with another Committed Development could occur depends on the nature of the impact identified (e.g. air quality effects as a result of the Project could occur at a greater distance than noise and vibration effects).

10.6.2 The methodology for how inter-project cumulative effects have been assessed within this PEI Report and how they will be assessed within the ES is provided in **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology.** In summary the key stages of the assessment are:

i. Stage 1a: Identify the Zone of Influence;

ii. Stage 1b: Identify long list of other developments;

iii. Stage 2: Establishing a shortlist of other existing development and/or approved development;

iv. Stage 3: Information gathering; and

v. Stage 4: Assessment.

10.6.3 Other electricity generation, storage, and transmission projects are being progressed by National Grid Electricity Transmission plc (National Grid) and other developers in the vicinity of the Project. In some cases, the construction of these developments will result in connections to the Project, which are outlined in **PEI Report Volume 2 Part B Sections 1-7 Chapter 1 Introduction**.

10.6.4 National Grid will seek to ensure collaboration across the design team of these developments, both internally and externally, to minimise the potential for significant cumulative environmental effects where practicable. This will include the appropriate integration of both temporary and permanent elements of these developments.

10.6.5 The CEA will consider potential inter-project cumulative impacts with these developments. Accordingly, the following projects may be included in the inter-project CEA depending on the level of information available at the time the full CEA is conducted:

i. Meridian Solar Farm;

ii. GT R4 Windfarm (Outer Dowsing);

iii. Bute Hydrogen Project 3;

iv. Weston Marsh to East Leicestershire;

v. Eco Grimsby West – Energy Storage and Photo Voltaic (PV) Array;

vi. Stallingborough PV and Battery Energy Storage System (BESS) – Energy Storage/Solar;

vii. Carbon Free 2030 – Energy Storage/Solar;

viii. Stallingborough Carbon Capture – Combined Cycle Gas Turbine (CCGT);

ix. Grimsby BESS – Energy Storage;

x. Mablethorpe Storage – Storage and CCGT;

xi. East Lincolnshire Solar – Energy Storage/Solar;

xii. SENECA – Interconnector;

xiii. Eco Mablethorpe – Energy Storage and PV Array;

xiv. Mablethorpe Green Energy Centre – Energy Storage and PV Array;

xv. Eastern Green Link (EGL) 3.

xvi. EGL 4;

xvii. EGL 5; and

xviii. Walpole Flexible Energy Generation.

10.6.6 It should be noted that some of the developments listed may not appear in **PEI Report Volume 3 Part C Appendix 10A Cumulative Effects Assessment Long List of Committed Developments** and **PEI Report Volume 3 Part C Appendix 10B Cumulative Effects Assessment Shortlist of Committed Developments**. This is due to their being limited information in the public domain for some of the developments listed. However all of them are being progressed as part of the inter-project cumulative assessment due to the reasons previously described.

Stage 1a: Establishing the Zone of Influence

10.6.7 Each environmental topic has a set Zone of Influence (ZoI) which is the area within which Committed Developments could interact with the Project. The ZoI is the geographic area within which a development is likely to affect environmental receptors. As such, the ZoI would vary for different types of receptors. The ZoI used for this PEI Report is based on a distance extending from the draft Order Limits and Refined Weston Marsh Siting Zone (hereafter referred to as the Refined Siting Zone). ZoIs for each environmental topic are reported in Table 4C.3 of **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology** and **PEI Report Volume 2 Part C Figure 10.1 Zones of Influence for Cumulative Effects Assessment**.

Stage 1b: Identifying a Long List of ‘Other Development’

10.6.8 An initial screening exercise of Committed Developments has been undertaken for the PEI Report to identify a list of Committed Developments currently within the consenting process within the maximum ZoI for the Project.

10.6.9 In accordance with the largest environmental topic ZoI, the search radius for Committed Developments was set at a 10 km radius around the Project.

10.6.10 An initial review of planning applications on relevant planning authority websites and the Planning Inspectorate’s Programme of Projects was conducted in December 2024. A provisional long list of developments is provided in **PEI Report Volume 3 Part C Appendix 10A Cumulative Effects Assessment Long List of Committed Developments**. This list will be regularly updated through ongoing planning reviews to capture new planning or development consent applications submitted since the initial scoping exercise.

10.6.11 The long list will remain subject to change throughout the ES preparation, reflecting the submission, approval, rejection, or withdrawal of applications. New developments will be added as they appear on planning portals, with a final cut-off date set six months prior to the submission of the Project's DCO application to allow for completion of the assessment.

10.6.12 The long list of Committed Developments is presented in **PEI Report Volume 3 Part C Appendix 10A Cumulative Effects Assessment Long List of Committed Developments.** In addition, **PEI Report Volume 2 Part C Figure 10.2 Long List of Committed Developments** presents the Committed Developments on the long list.

Stage 2: Identifying a Shortlist of 'Other Development' for the CEA

10.6.13 To generate the shortlist of developments for consideration, the longlist has been screened based on the scale and nature of the Committed Development, and the potential for interactions with the Project across all environmental topics. This has taken into consideration the ZoI of each environmental topic.

10.6.14 A total of 41 developments have been shortlisted and are proposed to be taken forward into Stage 3 and 4 of the CEA. The shortlist of Committed Developments is presented in **PEI Report Volume 3 Part C Appendix 10B Cumulative Effects Assessment Shortlist of Committed Developments**. In addition, **PEI Report Volume 2 Part C Figure 10.3 Shortlist of Committed Developments** presents the Committed Developments on the shortlist.

10.6.15 These Committed Developments are considered to have some potential for spatial or temporal overlap with the Project's construction or operational phases and warrant a full CEA be undertaken to fully understand any cumulative interactions between the Project and each Committed Development.

10.6.16 As part of this preliminary assessment, relevant environmental topics have been identified for each shortlisted development, presented in **PEI Report Volume 3 Part C Appendix 10B Cumulative Effects Assessment Shortlist of Committed Developments**. This is based on the topic ZoIs detailed in Table 4C.3 of **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology** and the availability of environmental information within the public domain.

Stage 3: Information Gathering and Stage 4: Cumulative Effects Assessment

10.6.17 As stated in **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**, at this preliminary stage in design development, stages 3 and 4 of the CEA have not been undertaken. This is proposed to be undertaken as part of the production of the ES.

10.7 Design, Control and Additional Mitigation Measures

Design Mitigation Measures

10.7.1 The Project and draft Order Limits and Refined Siting Zone have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford

Rules' (Ref 5) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 6) which apply to design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 7) and **PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered.** Principles include, but are not limited to, seeking to avoid areas of highest amenity, cultural or scientific value, taking advantage of natural screening provided by existing landform and features (e.g. woodland) and keeping visual, noise and other environmental effects to a minimum.

10.7.2 Each environmental topic as part of the individual topic assessments undertaken for the Project has considered and applied design, control and additional mitigation where necessary. These measures have inherently been considered in the CEA undertaken for the purposes of the PEI Report.

10.7.3 The specific mitigation measures being applied for each topic assessment can be found in the respective **PEI Report Volume 2 Part B** and **Part C** chapters.

10.7.4 Additional mitigation measures and monitoring for the CEA have not been considered at this stage due to the preliminary nature of the assessment that has been undertaken.

10.7.5 The assessment will be revisited and conducted in full as part of the production of the ES, at which time the need for cumulative specific mitigation measures will be considered and applied to the assessment as needed.

References

Ref 1 The Planning Inspectorate (2024). Scoping Opinion: Proposed Grimsby to Walpole Project [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000109-Scoping%20Opinion%202017%20EIA%20Regs.pdf [Accessed 12 March 2025].

Ref 2 National Grid Electricity Transmission (2024). Grimsby to Walpole Environmental Impact Assessment Scoping Report [online]. Available at: https://nsip-documents.planninginspectorate.gov.uk/published-documents/EN020036-000004-EN020036%20-%20Scoping%20Report%20Volume%201%20Main%20Report.pdf [Accessed 12 March 2025].

Ref 3 The Planning Inspectorate (2024). Nationally Significant Infrastructure Projects: Advice on Cumulative Effects Assessment [online]. Available at: https://www.gov.uk/guidance/nationally-significant-infrastructure-projects-advice-on-cumulative-effects-assessment#consideration-of-cumulative-effects-in-screening-schedule-2-development [Accessed 12 March 2025].

Ref 4 The Planning Inspectorate (2025). Nationally Significant Infrastructure Projects - Advice Note Nine: Rochdale Envelope [online]. Available at: https://www.gov.uk/government/publications/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope/nationally-significant-infrastructure-projects-advice-note-nine-rochdale-envelope [Accessed 10 April 2025].

Ref 5 National Grid (no date) The Holford Rules [online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf [Accessed 13 March 2025]

Ref 6 National Grid (no date) Horlock Rules [online] Available at: https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf [Accessed 13 March 2025]

Ref 7 National Grid,2024. Corridor Preliminary Routeing and Siting Study [online]. Available at: https://www.nationalgrid.com/electricity-transmission/network-and-infrastructure/infrastructure-projects/grimsby-to-walpole#:~:text=The%20way%20we%20generate%20electricity%20in%20the%20UK [Accessed 25 March 2025].

National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com