

**The Great Grid Upgrade**

Grimsby to Walpole

# Preliminary Environmental Information Report

Volume 2 Part B Section Specific Assessments

Section 5 Refined Weston Marsh Substation Siting Zone

Chapters 1 to 13

June 2025



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# Grimsby to Walpole

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# Preface

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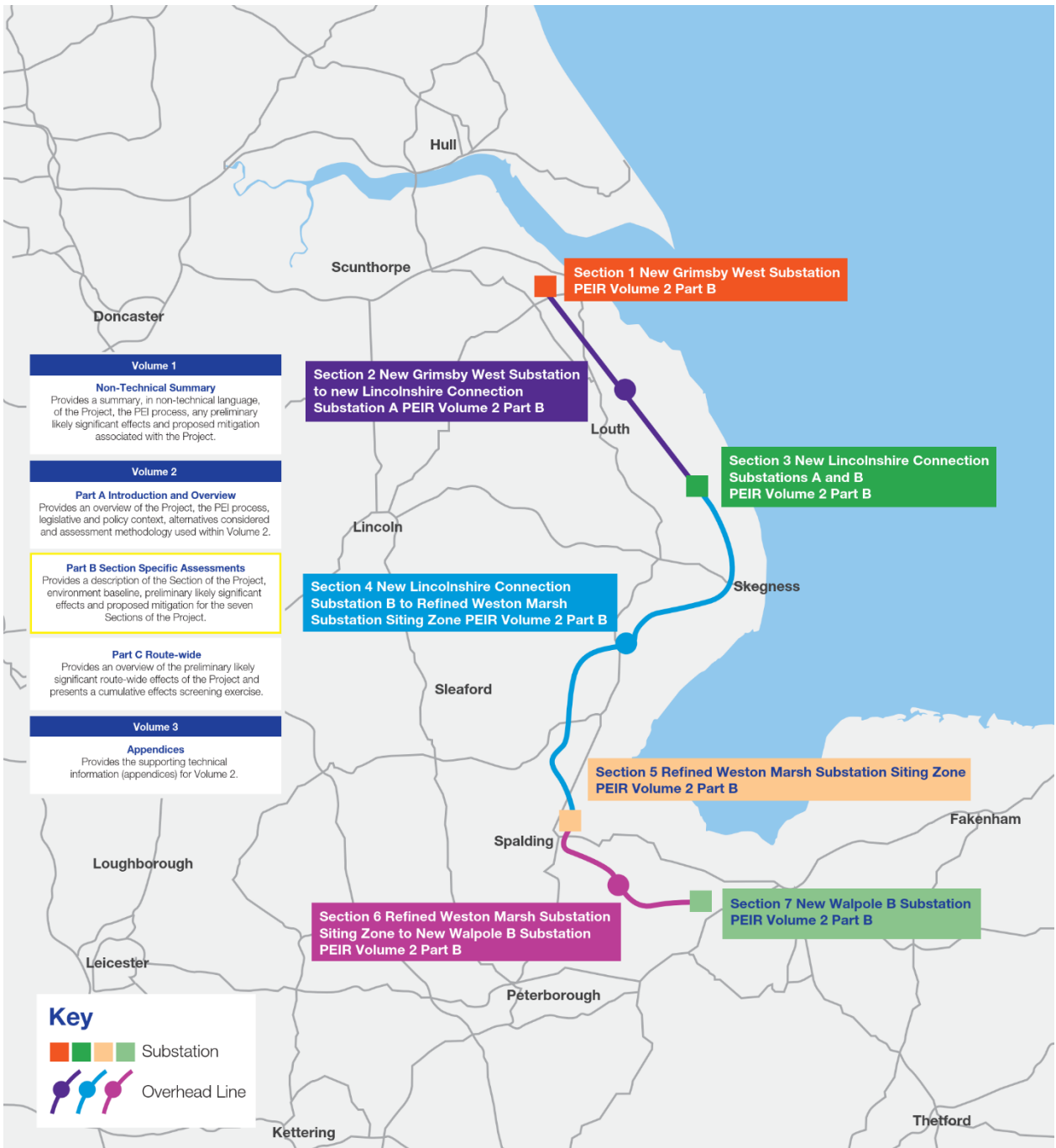
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# 1. Part B Preface

## 1.1 Structure and Context of the Preliminary Environmental Information Report

- 1.1.1 This **Preliminary Environmental Information (PEI) Report Volume 2 Part B** 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 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 volumes:
- 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:



# References

- Ref 1      References 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 21 February 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. Overview of the Section and Description of the Project

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# 1. Overview of the Section and Description of the Project

## 1.1 Overview of the Section

- 1.1.1 This chapter presents an overview of the Grimsby to Walpole Project (the Project) within the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) and has informed the preliminary environmental assessments reported in subsequent Chapters 2 to 13 within Preliminary Environmental Information (PEI) Report Volume 2 Part B Section 5.
- 1.1.2 It should be noted that Section 5 comprises less design information compared to other Sections. Since the non-statutory consultation National Grid have been engaging with generators who are contracted to connect in this area, alongside reviewing the technical specifications required. As a result, further design work is being undertaken including consideration of whether there is a need for up to two new substations. National Grid will undertake further targeted statutory consultation on Section 5 (including publication of preliminary environmental information) at a future date when this design work has been completed. For the purposes of this PEI Report, an appraisal has been undertaken of the Weston Marsh area considering up to two substations as well as associated electrical connections between them.
- 1.1.3 Section 5 is located in the southern extent of the Project and subject to design, will comprise up to two new 400 kV substations with an appropriate 400 kV electrical interconnection (either underground cable or overhead line) between the substations, should two be required. As a reasonable worst case, the preliminary environmental assessment has assumed two Weston Marsh substations located within the Refined Siting Zone: Weston Marsh Substation A and Weston Marsh Substation B with an overhead line between them.
- 1.1.4 The Refined Siting Zone is presented in **PEI Report Volume 2 Part B Section 5 Figure 1.1 Refined Siting Zone**. The Refined Siting Zone for Section 5 sits at the southern extent of the Project, commencing south of the River Welland and ending northwest of Weston. The Section is located within the local authority area of South Holland.
- 1.1.5 In summary, within Section 5, for the purpose of the preliminary environmental assessment it is assumed that the Project includes the following components and activities:
- i. New 400 kV overhead line connecting into one of the proposed new Weston Marsh Substations from the Route Section break between Section 4 New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone (Section 4) and Section 5 to the Route Section break between Section 5 and Section 6 Refined Weston Marsh Substation Siting Zone to New Walpole B Substation (Section 6);
  - ii. Up to two new 400 kV substations and a 400 kV electrical connection between the substations should two be required; and

iii. Modifications to existing 400 kV overhead lines known as 4ZM and 2WS.

1.1.6 A more detailed description of Section 5 is provided in section 1.2 below.

## 1.2 Proposed Project

### Refined Weston Marsh Substation Siting Zone

#### Design and overview

- 1.2.1 Substations play a key role in the electricity transmission system, helping to manage and control electricity flows as well as connecting generators and/or connecting to the electricity distribution network at grid supply points.
- 1.2.2 Subject to design up to two substations with an appropriate electrical interconnection (either underground cable or overhead line) between them would be located in Section 5. Unless otherwise stated, as a reasonable worst case, the preliminary environmental assessment has assumed two Weston Marsh substations located within the Refined Siting Zone: Weston Marsh Substation A and Weston Marsh Substation B with an overhead line between them.
- 1.2.3 It is expected that the proposed new Weston Marsh Substation A would connect to the new 400 kV transmission line coming from the proposed new Lincolnshire Connection Substation B. The proposed new Weston Marsh Substation A would connect to the proposed new Weston Marsh Substation B and then the new 400 kV transmission line onwards to the proposed new Walpole B Substation. In line with the information presented in the CPRSS (Ref 1), and although subject to ongoing design, the proposed new Weston Marsh Substation A is anticipated to be located in the vicinity of the Spalding Tee-point where the existing 400 kV 4ZM and 2WS overhead lines intersect, in order to limit the extent of diversions of these two existing overhead lines that would be required to facilitate turn-ins to the new substation. Further design work is required to determine details of the substation and overhead line infrastructure required within Section 5.
- 1.2.4 For the purposes of the preliminary environmental assessment and consistent with paragraph 2.5.6 of the CPRSS (Ref 1), it has been assumed that the proposed new Weston Marsh Substation A and the proposed new Weston Marsh Substation B will be Air Insulated Switchgear (AIS) substations. AIS substations use air as the insulation medium for electrical equipment meaning that equipment is predominantly located outdoors. It has also been assumed that the proposed substation(s) would be located within a separate secured fenced compound, and that that the footprint of the proposed new Weston Marsh Substation A would be approximately 550 m by 200 m (approximately 11 ha) and proposed new Weston Marsh Substation B would be approximately 380 m by 200 m (approximately 8 ha). The maximum height for High Voltage (HV) plant and buildings within the proposed new Weston Marsh Substations A and B has been assumed to be 12.5 m, and the maximum height for gantries has been assumed to be 15 m.
- 1.2.5 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. For the purpose of the PEI Report, it is assumed that the 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). Further information regarding substation lighting design will be provided within the project description within the Environmental Statement.

### Electrical connection

- 1.2.6 Should two substations within Section 5 be required, a 400 kV electrical connection between the substations will be required. Further design work still needs to be undertaken to determine whether the 400 kV electrical connection within Section 5 would consist of overhead line or underground cable. The preliminary environmental assessment has assumed an overhead line connection.

### Mitigation measures

- 1.2.7 As detailed within **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information** there are three types of mitigation measures that have been considered across the Project. In summary the three types are:
- i. design mitigation measures which are those that are intrinsic to and built into the design;
  - ii. control mitigation measures which comprise management activities, control measures and techniques, that would be implemented during construction or operation of the Project to limit impacts; and
  - iii. additional mitigation measures which comprise measures over and above any design or control and management mitigation measures, for which the EIA has identified a requirement to further reduce significant environmental effects.
- 1.2.8 As the design work is still being undertaken, mitigation measures are yet to be identified for Section 5.

### Section 5 Design Assumptions and Limitations

- 1.2.9 The assessment for Section 5 is based on the Refined Siting Zone boundary, in respect of which there is less design information than for other Sections of the Project. Therefore, unlike the rest of the Project, the PEI for Section 5 does not illustrate draft Order Limits or defined limits of deviation. This reflects the need for further design activities to be undertaken for Section 5 based on the emergence of further design parameters which need to be considered within the Refined Siting Zone.
- 1.2.10 As such a series of general design assumptions have been implemented which apply to each preliminary assessment reported within the PEI Report in respect of Section 5.

#### Assumptions

- 1.2.11 For the purposes of the PEI, it is assumed that:
- i. subject to design there will be up to two new substations within Section 5. As a reasonable worst case, the PEI assessment has assumed two substations located within the Refined Siting Zone which are referred to as Weston Marsh

- Substation A and Weston Marsh Substation B, both of which are assumed to be AIS substations;
- ii. Substation A will be located near the Spalding Tee-point; the location of Substation B remains subject to further design development;
  - iii. the operational footprint of the substations is estimated to be approximately 550 m × 200 m (11 ha) for Substation A and 380 m × 200 m (8 ha) for Substation B;
  - iv. the connection between the substations will be a new 400 kV overhead line, though underground cabling remains under consideration as the design progresses;
  - v. Section 5 will connect to Section 4 in the north and Section 6 in the south via overhead lines;
  - vi. work will be required to reconfigure the existing 400 kV overhead lines, involving both temporary overhead line diversions and permanent modifications to the existing overhead line alignments. Once detailed design information becomes available, it will be possible to determine which specific pylons need to be dismantled and removed;
  - vii. the maximum height for high-voltage plant and buildings is 12.5 m, and 15 m for gantries;
  - viii. any new overhead line constructed in Section 5 would comprise conductors supported by pylons. In line with other Sections, typical pylon operating at 400 kV would be approximately 50 m in height, however the proposed height of each pylon would depend on the specifics of each location such as topography, land use and crossings (e.g. including other electricity networks, watercourses and other obstacles);
  - ix. all operational lighting will adhere to relevant design standards and National Grid specifications and environmentally sensitive for example through the incorporation of low-level, event-activated, and low-brightness lighting;
  - x. no stopping up or diversion of watercourses is anticipated where they are crossed by the Project within Section 5;
  - xi. temporary watercourse crossings will be facilitated by the use of culverts, which will be removed and the channels reinstated post-construction. The number of watercourse crossings will be confirmed through design development;
  - xii. at least one watercourse crossing will be required to temporarily cross the River Welland, the location of which is to be confirmed;
  - xiii. environmentally sensitive sites will be avoided where practicable; and
  - xiv. existing highway infrastructure will be used for access to Section 5, with construction HGVs to access bellmouths via local roads linking to the A151 and A16. Whilst construction workers will access compounds via the A151 and surrounding road networks, including the A16, A17, and other local roads.

#### Limitations

- i. given that the design within Section 5 is subject to further development to determine the precise location of the substations, associated ancillary works and

- connections, the preliminary assessment is typically of a more qualitative nature relative to the PEI presented for other sections of the Project;
- ii. details on temporary construction and permanent access will be confirmed following further design development. Therefore, the reporting of potential construction impacts and effects is based upon a number of worst case assumptions regarding potential works within the Refined Siting Zone. Once additional design detail is known, the preliminary assessment will be reviewed and updated as required to inform further, localised consultation on Section 5;
  - iii. traffic projections for Section 5 are based upon high level estimates of the potential volume of construction traffic associated with substation and overhead line construction. These projections will therefore be refined based upon additional design and construction information for construction of the proposed Weston Marsh infrastructure;
  - iv. the staff requirements for the operation and maintenance of the substation(s) is yet to be developed and further detail will be provided within the ES; and
  - v. where additional dedicated accesses may be required, these are not currently included within the preliminary assessment of effects. Once additional design detail is known, the preliminary assessment will be reviewed and updated to include any required dedicated accesses, to inform further, localised consultation on Section 5, and, thereafter, development of the ES.

## **Construction**

- 1.2.12 Subject to gaining development consent in 2028, it is anticipated that construction of the Project would commence in 2029, starting with enabling works. It is expected that the main construction works (construction of substations and overhead line) would continue through to 2033 (four years).
- 1.2.13 While further design work still needs to be undertaken, it is anticipated that construction of the proposed new Weston Marsh Substation A and proposed new Weston Marsh Substation B would include the following key stages and activities:
- i. site establishment;
  - ii. site preparation and earthworks;
  - iii. civil works;
  - iv. construction of buildings;
  - v. installation of electrical equipment;
  - vi. site reinstatement and landscaping; and
  - vii. commissioning.
- 1.2.14 While further design work still needs to be undertaken, it is anticipated that construction of the 400 kV overhead line would generally follow the sequence outlined below:
- i. surveys including archaeological investigation;
  - ii. ground investigation;
  - iii. installation of bellmouths and creation of visibility splays;

- iv. installation of stock proof fencing and gates or equivalent;
- v. topsoil stripping, temporary drainage installation where required;
- vi. installation of access tracks (including culverts and bridges) and demarcated pylon working areas;
- vii. installation of pylon foundations (pad and column, mini pile, tube pile or bespoke);
- viii. working area and layout of steelwork in preparation for erection;
- ix. assembly (painting if required) and erection of steelwork;
- x. installation of tower signage including safety notice plate and anti-climbing devices;
- xi. installation of crossing protection prior to stringing of conductors, including scaffolding;
- xii. installation of insulator assemblies on suspension pylons;
- xiii. establishment of machine sites for conductor stringing;
- xiv. conductor and earthwire stringing;
- xv. temporary earthing;
- xvi. installation of tension insulator assemblies on tension and terminal pylons;
- xvii. removal of construction equipment and reinstatement of ground and restoration of soils;
- xviii. removal of access tracks and bellmouths; and
- xix. removal of construction compounds and ground reinstatement.

- 1.2.15 As noted, further design work still needs to be undertaken to determine whether the 400 kV electrical connection within Section 5 will consist of overhead line or underground cable. Should the electrical connection between the proposed new Weston Marsh Substation A and the proposed new Weston Marsh Substation B consist of underground cable, they would typically comprise nine transmission cables. Each cable would be approximately 150 mm in diameter and buried within a series of 3 No trenches excavated to a minimum depth of 1.4 m. They would be surrounded by an additional layer of cement bound sand to provide a thermally resistant barrier, and this is then topped with protective warning tile tape which protects the cables from accidental excavation.
- 1.2.16 Furthermore, should underground cable be required, a permanent easement of 50 m is assumed for open cut installation, and 180 m for trenchless installation. This would be reduced to consider sensitive features or may increase subject to site conditions.
- 1.2.17 Depending on the cable manufacturer and availability of cable lengths, joint bays would be required every 500 m to 1 km. At these locations, above ground link boxes would be required. The dimensions, frequency and specific locations of the link boxes would be confirmed through detailed design, however, where practicable, they would be located near field boundaries.
- 1.2.18 In regard to temporary construction requirements and construction and permanent access for Section 5, these details will be confirmed once further design work has



been undertaken. The land on which construction compounds are located would be reinstated upon completion of construction.

- 1.2.19 **PEI Report Volume 2 Part A Chapter 5 Project Description** provides further information on the what the construction of the proposed substations and proposed 400 kV overhead line for the Project entails.

### **Operation**

- 1.2.20 During operation the Project would reinforce the electricity transmission network and support connections. Once operational, on-site activity at the proposed new Weston Marsh Substation A and the proposed new Weston Marsh Substation B would generally be limited to regular inspection and maintenance. Furthermore, overhead lines require minimal maintenance during operation and will be monitored and regularly inspected for signs of fatigue. Subject to planting within the vicinity of Section 5, it is assumed that there will be an ongoing vegetation management regime. Overall, once operational, the overhead line will not generate significant activity beyond ordinary inspection and maintenance.
- 1.2.21 **PEI Report Volume 2 Part A Chapter 5 Project Description** provides further information on the what the operation and maintenance of the proposed substations and the proposed 400 kV overhead line for the Project entails.

# References

- Ref 1 Grimsby to Walpole Corridor Preliminary Routeing and Siting Study. January 2024 [online]. Available at: <https://www.nationalgrid.com/document/352621/download>[Accessed 3 March 2025].

# 2. Landscape

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## 2. Landscape

### 2.1 Introduction

- 2.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Landscape assessment for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 2.1.2 The assessment for Section 5 is based on a Refined Siting Zone boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 2.1.3 Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 2.1);
  - ii. Identification of key local and regional policy relevant to the assessment (section 2.2). 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 subsequent scope of the Landscape assessment (section 2.3). 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 Landscape assessment within Section 5 (section 2.4). 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 Section 5 Study Area relevant to the Landscape assessment (section 2.5);
  - vi. A description of mitigation measures included for the purposes of the Landscape assessment reported within the PEI Report (section 2.6). 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 Landscape effects arising during construction and operation of the Project within the Section 5 Study Area based upon the assessment completed to date (section 2.7); and

viii. An outline of the proposed monitoring requirements in relation to Landscape (section 2.8).

2.1.4 Further supporting information is set out in **Table 2.1** below, including supporting figures and technical appendices.

Table 2.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 2.1 Landscape Designations and Features;</b> <b>Figure 2.2 Landform and Drainage;</b> <b>Figure 2.3 National Character Areas; and</b> <b>Figure 2.4 Regional and Local Landscape Character Areas.</b>
<b>PEI Report Volume 3 Part B Appendix 2A Landscape Character Baseline</b>	Description of the landscape character baseline across the route of the Project.
<b>Project Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.

Supporting Information	Description
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 2.1.5 There are also interrelationships between the potential effects on Landscape 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 5 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 Section 5 Chapter 4 Ecology and Biodiversity** should be consulted in relation to impacts on trees and woodland. An Arboricultural Impact Assessment will be presented as an appendix to the ES and will be cross referenced in relation to impacts on trees and woodland. Both documents will be used to help inform the baseline landscape and support the assessment of effects on the landscape reported in the ES.
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 5 Historic Environment** should be consulted in relation to historic assets including historic landscapes and Registered Parks and Gardens, which may contribute to the value of the landscape. This helps to inform the baseline description and supports the assessment of effects on the landscape.
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement** should be consulted in relation to increased traffic flows, which may influence the character of the landscape through noise and visual disturbance. This helps to inform the baseline description and supports the assessment of effects on the landscape.
  - v. **PEI Report Volume 2 Part B Section 5 Chapter 10 Noise and Vibration** should be consulted in relation to noise intrusion, which may affect the perceptual qualities of the landscape. This helps to inform the baseline description and supports the assessment of effects on the landscape.
  - vi. **PEI Report Volume 2 Part B Section 5 Chapter 11 Socio-economics, Recreation and Tourism** should be consulted in relation to areas of recreational importance which may contribute to the value of the landscape. The outputs of the landscape assessment will inform the assessment of effects on recreation and tourism.

- vii. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
- viii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.

## 2.2 Legislation and Policy Framework

### Legislation and National Policy

- 2.2.1 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** and supporting appendices, detail of which is set out in **Table 2.1**.

### Regional and Local Policy

- 2.2.2 Regional and local plans or policies relevant to this assessment are as follows:
  - i. South East Lincolnshire Local Plan 2011 – 2036 (adopted 2019) (Ref 1).
    - Policy 31: Climate Change and Renewable and Low Carbon Energy. The development of renewable energy facilities, associated infrastructure and the integration of decentralised technologies on existing or proposed structures will be permitted provided, individually, or cumulatively, there would be no significant harm to visual amenity (amongst other factors).

## 2.3 Scope of Assessment

- 2.3.1 The scope of the assessment 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 EIA Scoping Report (Ref 3). 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 Landscape 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**.
- 2.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 2.3.3 The scope of the construction and operation assessment for Section 5 covers the following receptor types:
  - i. Locally designated landscapes;
  - ii. Landscape Character Types (LCT);
  - iii. Regional Landscape Character Types (RLCT); and



iv. Landscape Character Areas (LCA).

- 2.3.4 For completeness and to provide further context to the assessment, the relevant National Character Areas (NCA) as defined by Natural England (Ref 4) are listed under baseline conditions in Section 2.5. This is to ensure that the potential for significant effects at a wider level than district level is understood, given the length of the route and geographical coverage of the Project. An assessment of the effects of the Project on the NCAs will be provided in the project-wide assessment of landscape effects presented in the ES once the assessments of the more detailed regional and local landscape types have been completed.
- 2.3.5 East Midlands RLCT 1A: Coastal Saltmarshes and Mudflats is located within the Study Area but has been scoped out due to distance from the Refined Siting Zone and because the potential for significant effects is unlikely.
- 2.3.6 Where a receptor is impacted by multiple sections of the Project, section 2.7 describes the impact upon the receptor within this Section first. It then provides an aggregated assessment of all impacts across all Section upon the receptor to assess how the cumulative effect of the Project as a whole impacts the receptor from a landscape perspective.

## 2.4 Assessment Methodology

- 2.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Landscape 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 is outlined below.

### Approach

- 2.4.2 As explained in paragraph 5.1 of GLVIA3 “*An assessment of landscape effects deals with the effects of change and development on landscape as a resource*”. Changes may affect the elements that make up the landscape, its aesthetic and perceptual aspects, and its distinctive character.
- 2.4.3 Landscape receptors are the elements or aspects of the landscape that may be affected by a proposed development or change. These can include physical, visual, and experiential components of the landscape.
- 2.4.4 The Landscape assessment is based on published landscape character assessments across the Study Area. The preliminary baseline for the assessment is presented in the **PEI Report Volume 3 Appendix 2A Landscape Character Baseline**.
- 2.4.5 In accordance with GLVIA3 (Ref 5), the assessment of landscape effects involves evaluating both the nature of the landscape receptors (their sensitivity) and the nature of the effects on those receptors (the magnitude of effect). These factors are then considered together to form an overall judgment regarding the significance of landscape effects.
- 2.4.6 The Landscape section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** describes the methodology used to evaluate sensitivity and magnitude and how the judgements on

sensitivity and magnitude of effect are combined to make an informed professional assessment of the significance of each landscape effect. A summary of the approach is set out below.

### **Establishing Landscape Sensitivity**

- 2.4.7 In accordance with paragraph 5.39 of GLVIA3 (Ref 5) evaluations of the sensitivity of a landscape receptor to change are based on consideration of the professional judgements on the value attached to the landscape (which is established and reported as part of the baseline) and the susceptibility of the landscape to change arising from the Project. These judgements are guided by the indicative criteria set out in the Landscape section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Judgements on value and susceptibility are recorded as either very high, high, medium or low.

### **Predicting the Magnitude of Change**

- 2.4.8 In accordance with paragraph 5.48 of GLVIA3 (Ref 5), evaluations of the magnitude of landscape change are based on consideration of the professional judgements on size/scale, geographical extent, duration and reversibility of the predicted change. They are guided by the indicative criteria set out in the Landscape section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Judgements on the magnitude of predicted landscape change are recorded as large, medium, small and very small.

### **Judging Levels of Landscape Effect and Significance**

- 2.4.9 The final step in the assessment requires the judgements on the sensitivity of the landscape receptors and the predicted magnitude of landscape change to be combined to make an informed professional assessment of the significance of each landscape effect. In accordance with paragraph 5.55 in GLVIA3 (Ref 5), the evaluations of the individual aspects set out above (susceptibility, value, size and scale, geographical extent, duration and reversibility) are considered together to provide an overall profile of each identified landscape effect, guided by the indicative criteria set out in in the Landscape section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 2.4.10 Professional judgement and experience are applied to balance the many variables that need to be considered and given different weight according to site-specific and location-specific considerations.
- 2.4.11 Levels of landscape effect are identified as major, moderate, minor, or negligible, and the direction of change as beneficial or adverse. Effects judged to be moderate or major are considered significant in the context of the EIA Regulations (Ref 6). The general approach taken to determining the significance of effect in this preliminary assessment is only to state whether effects are likely or unlikely to be significant, rather than assigning significance levels, which will be presented in the ES.

### **Assessment Assumptions and Limitations**

- 2.4.12 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.

- 2.4.13 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**. In addition to these, the following Section 5 specific Landscape assessment assumption and limitation has been applied.
- 2.4.14 As Section 5 is currently a Refined Siting Zone and the locations of the proposed substation(s) and overhead lines are unknown, a Zone of Theoretical Visibility (ZTV) has not been produced. A ZTV will be provided when more design information is provided. Please refer to **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description** of the Project for a description of what has been assessed for Section 5 in the absence of a design.
- 2.4.15 The key parameters and assumptions which inform the assessment 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.

## 2.5 Baseline Conditions

### Study Area

- 2.5.1 The Study Area for the preliminary Landscape assessment is shown on **PEI Report Volume 2 Part B Section 5 Figure 2.1 landscape Designations and Features**. The extent of the Study Area for the preliminary Landscape assessment (based on the same approach which will be adopted when defining the EIA study area), extends 5 km from Section 5.
- 2.5.2 This distance was informed by the scale and appearance of a typical 400 kilovolt (kV) substation (as detailed in **PEI Report Volume 2 Part A Chapter 5 Project Description**), field survey and professional judgment, and is considered sufficient to capture the likely significant landscape effects. Based on previous experience of similar schemes, significant impacts on the character and perception of the landscape are highly unlikely to arise beyond this distance.
- 2.5.3 A ZTV map will be produced once more information on the design of the Project in Section 5 becomes available. This will inform the detailed Landscape assessment which will be presented in the ES.
- 2.5.4 The preliminary cumulative Landscape assessment Study Area extends 10 km from the Refined Siting Zone. This radius was established to evaluate potential cumulative landscape impacts in conjunction with other committed developments.
- 2.5.5 Further information on Study Area definition is presented in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 2.5.6 To ensure that all likely significant effects are captured in the assessment, the Study Area will continue to be reviewed in the light of feedback received during statutory consultation, ongoing site surveys, and following the production of a ZTV as the Project develops.

## Data Collection

- 2.5.7 The following data has been used to inform the baseline conditions:
- i. Ordnance Survey (OS) 1:10,000, 1:25,000, 1:50,000 and 1:250,000 base mapping;
  - ii. OS Terrain® 50 mid-resolution and LIDAR Composite 2017 – 50 cm Digital Terrain Model (DTM);
  - iii. Google Earth Pro aerial photography, and Google Maps Street View;
  - iv. Base mapping from ArcGIS Map Service;
  - v. Open source Geographic Information System (GIS) data;
  - vi. East Midlands Regional Landscape Character Assessment (Ref 7); and
  - vii. Natural England National Character Area Profiles (Ref 4).
- 2.5.8 Site surveys were carried out during several visits under differing weather conditions between Spring 2023 and Summer 2024.

## Existing Baseline

- 2.5.9 The following section outlines the Landscape baseline and should be read in conjunction with **PEI Report Volume 3 Part B Appendix 2A Landscape Character Baseline**. The appendix provides a description of the landscape, including its elements, features, and overall character, with reference to the landscapes and landscape character areas listed below. It also includes judgements on the landscape's relative value and its susceptibility to change resulting from the Project.
- 2.5.10 The baseline section should also be read in conjunction with the following supporting Figures, as found within **PEI Report Volume 2**:
- i. **PEI Report Volume 2 Part B Figure 2.1 Landscape Designations and Features;**
  - ii. **PEI Report Volume 2 Part B Figure 2.2 Landform and Drainage;**
  - iii. **PEI Report Volume 2 Part B Figure 2.3 National Character Areas;**
  - iv. **PEI Report Volume 2 Part B Figure 2.4 Regional and Local Landscape Character Areas;** and
  - v. **PEI Report Volume 3 Appendix 2A Landscape Character Baseline.**
- 2.5.11 **PEI Report Volume 2 Part B Section 5 Figure 2.1 Landscape Designations and Features** shows the distribution of woodland across the Study Area.

## Designated Landscapes

- 2.5.12 There are no designated landscapes within the Study Area for the Project in Section 5.

## Landscape Character

- 2.5.13 The following landscape character areas cover the Study Area for Section 5.
- i. Natural England - National Character Area Profiles (NCA); and

- NCA 46 The Fens.
- ii. East Midlands Regional Landscape Character Types (RLCT)
  - RLCT 2A Settled Fens and Marshes which is considered to be of medium value and medium susceptibility to the Project.

## Future Baseline

- 2.5.14 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.
- 2.5.15 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.
- 2.5.16 Ash trees (*Fraxinus excelsior*) within the Study Area for Section 5 may be affected by ash dieback, a frequently fatal disease caused by the fungus *Hymenoscyphus fraxineus*. Therefore, the future baseline assumes long-term ash tree loss, with other species filling gaps in the short term, keeping overall vegetation levels similar. An Arboricultural Impact Assessment will record incidents of ash dieback, which in turn will inform the detailed Landscape assessment presented in the ES.

## 2.6 Design, Control and Additional Mitigation Measures

### Design Mitigation Measures

- 2.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 9) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 10), which apply to the design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 12) 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.
- 2.6.2 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routeing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.

- 2.6.3 The Project has also committed to producing an Outline Landscape Environmental Management Plan (LEMP) (commitment GG06), which will set out the measures to protect existing vegetation and details regarding the reinstatement and additional planting. This will also account for biodiversity net gain targets (see **PEI Report Volume 2 Part B Sections 1-7 Chapter 4 Ecology and Biodiversity**) and will accompany the ES and DCO application.
- 2.6.4 Due to the likely size and scale of Weston Marsh Substation A and Weston Marsh Substation B, as well as the relatively flat topography, it would not be feasible to completely screen the site from all locations. As part of the iterative design and assessment process, a comprehensive landscape scheme will be developed to integrate the new infrastructure and reduce its visibility within the broader landscape. This will be presented in the ES as part of the Outline LEMP.
- 2.6.5 This will include proposals for planting native trees and shrubs around the perimeter of the substation(s), where technically feasible, taking into account the constraints of the new connections. This will help soften the site's perimeter and allow the development to blend more naturally into the surrounding landscape while also screening views. The types and heights of trees and shrubs will be determined by local planning policy, safety clearance requirements from the proposed connections and feedback from local residents.
- 2.6.6 A detailed mitigation plan for Section 5 will be presented in the ES. This will include proposals for planting, including indicative species mixes and will be presented as part of the Outline LEMP.

## Control Mitigation Measures

### Construction

- 2.6.7 A Preliminary Code of Construction Practice (CoCP) is provided in **PEI Report Volume 3 Appendix 5A Preliminary CoCP**. The control measures included within the Preliminary CoCP relevant to the Landscape assessment of Section 5 include:
- i. 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 LEMP. 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.
  - ii. LV02: The contractor(s) will apply the relevant protective principles set out in BS 5837:2012: Trees in relation to design, demolition, and construction (Ref 11). This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. An Arboricultural Clerk of Works will ensure the suitability of tree protection before and during the construction phase. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken, or supervised by a suitably qualified arboriculturist.

- iii. 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.
- iv. LV04: Construction lighting will be of the lowest luminosity necessary to safely perform tasks. Lighting will be directional and minimised where possible.
- v. B08: Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance.
- vi. 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 Construction Environmental Management Plans (CEMP).

## Additional Mitigation Measures

- 2.6.8 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.
- 2.6.9 As the location of the overhead line and substation(s) is currently unknown, no additional mitigation measures have been identified as being required for Landscape in Section 5 at the time of writing this PEI Report. This will be reviewed and updated accordingly for the ES following completion of the full Landscape assessment.
- 2.6.10 Any measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders, including engagement with the statutory consultees.
- 2.6.11 Finalised additional mitigation measures will be detailed within the ES.

## 2.7 Preliminary Assessment of Effects

- 2.7.1 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 and/or operational activities within Section 5.
- 2.7.2 The preliminary assessment of effects reported below takes into account the Design Mitigation Measures and Control Mitigation Measures as previously described.
- 2.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**.
- 2.7.4 The Landscape effects of maintenance activities during operation are scoped out of the assessment as agreed in the Scoping Opinion adopted by the Secretary of State on 10 September 2024 (Ref 2).
- 2.7.5 As explained in section 2.4 of this PEI Report, the Natural England NCA 46 the Fens, which is included in the baseline above, is not assessed at this preliminary stage. An

assessment of the effects of the Project on this NCA will be provided in the project-wide assessment of landscape effects presented in the ES once the more detailed assessments have been completed.

- 2.7.6 Where an effect is reported in this PEI Report, it is an adverse effect unless stated otherwise.
- 2.7.7 Reference is made in the assessment to 'direct' and 'indirect effects'. Direct effects involve physical changes to components of the landscape, such as vegetation removal or the presence of new structures, while indirect effects arise from the interaction between the Project and its surrounding context for example, effects on the character and perception of the landscape.
- 2.7.8 It is noted that this assessment 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

- 2.7.9 Changes in the character and perception of a view may occur during construction as a result of physical impacts on the landscape, including vegetation clearance and the establishment and operation of construction compounds, storage areas, access tracks, and the movement of plant (such as mobile cranes), vehicles, and personnel. However, these effects would be temporary and reversible, with the landscape reinstated upon completion of the works<sup>1</sup>.

### East Midlands Regional Landscape Character Types (RLCT)

RLCT 2A Settled Fens and Marshes

- 2.7.10 RLCT 2A Settled Fens and Marshes, which is located within the Study Area for Section 5, is also located in:
- i. Section 2: New Grimsby West Substation to New Lincolnshire Connection Substation A;
  - ii. Section 3: New Lincolnshire Connection Substations A and B;
  - iii. Section 4: New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone;
  - iv. Section 6: Refined Weston Marsh Substation Siting Zone to Walpole B Substation; and
  - v. Section 7: New Walpole B Substation.

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<sup>1</sup> To prevent double counting, the effects resulting from vegetation loss are assessed as part of the operational phase rather than the construction phase. This approach ensures that the long-term impacts of vegetation removal on visual amenity are considered in the context of the final, post-construction condition.



- 2.7.11 The preliminary assessment of the effects on RLCT 2A: Settled Fens and Marshes presented below considers the part of the RLCT that is located within the Study Area for Section 5.
- 2.7.12 RLCT 2A: Settled Fens and Marshes would be directly impacted by the construction of up to two new substations and the construction and operation of construction compounds and haul roads. It would also be indirectly affected by the construction of the new 400 kV overhead line in the parts of the RLCT in Sections 4 and 6 and close to Section 5.
- 2.7.13 Although the works would impact an area of intensively farmed landscape, the landscape is open and the size/scale of change would diminish its scenic quality and rural character, introducing substantial movement and disturbance across the part of the RLCT in Section 5. The construction activity would fundamentally alter both the landscape's character and how it is perceived. Combined with the landscape's medium value and susceptibility, the overall magnitude of change is expected to be large, likely resulting in a significant effect on this part of the RLCT in Section 5.
- 2.7.14 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 large category. When combined with the medium value and medium susceptibility of RLCT 2A: Settled Fens and Marshes, the Project would give rise to a likely significant effect.

### **Operation**

- 2.7.15 The potential effects that could result from the operational phase of the Project are changes to the composition, character and perception of the landscape due to long-term loss of elements and features in the landscape, changes to the landform, introduction of new infrastructure and introduction of landscape elements such as trees and hedgerows. The effects would be long-term and are considered permanent.

### **East Midlands Regional Landscape Character Types (RLCT)**

#### RLCT 2A Settled Fens and Marshes

- 2.7.16 RLCT 2A Settled Fens and Marshes, which is located in Section 5, is also located in:
- i. Section 2: New Grimsby West Substation to New Lincolnshire Connection Substation A;
  - ii. Section 3: New Lincolnshire Connection Substations A and B;
  - iii. Section 4: New Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone;
  - iv. Section 6: Refined Weston Marsh Substation Siting Zone to Walpole B Substation; and
  - v. Section 7: New Walpole B Substation.
- 2.7.17 The preliminary assessment of the effects on RLCT 2A: Settled Fens and Marshes presented below considers the part of the RLCT that is located within the Study Area for Section 5.

- 2.7.18 RLCT 2A: Settled Fens and Marshes would experience direct impacts from loss of vegetation and other landscape elements and features, as well as indirect effects on scenic quality from the presence of the substation(s). These changes would alter the sense of place and diminish the rural character of the open farmland. Additionally, the landscape would be further influenced by the new 400 kV overhead line, which would affect the perception of the RLCT together with the overhead line in Sections 4 and 6 close to Section 5.
- 2.7.19 While this area is intensively farmed and already influenced by the urbanising effects of several main roads, the scale and extent of change in the open farmland would fundamentally alter both character of the landscape and how it is perceived. The magnitude of change is expected to be large. Given the landscape's medium value and susceptibility, this is likely to result in a significant effect on the RLCT within Section 5.
- 2.7.20 Over time, the mitigation planting associated with substation(s) would have matured, helping to screen and integrate the infrastructure into the wider landscape. While this would reduce the overall landscape effects, the scale of the Project means that a significant effect is still likely to remain.
- 2.7.21 When considering the operation phase of the Project in its entirety across all Sections, the overall magnitude of predicted change increases but remains in the large category. When combined with the medium value and medium susceptibility of RLCT 2A: Settled Fens and Marshes, the Project would give rise to a likely significant effect.

## **2.8 Monitoring**

- 2.8.1 No landscape monitoring is currently proposed for Section 5, as it is only necessary to ensure the establishment of mitigation planting. A five-year aftercare period for mitigation planting is secured through the Preliminary CoCP, eliminating the need for additional monitoring measures.

# References

- Ref 1 South East Lincolnshire Joint Strategic Planning Committee (2019). South East Lincolnshire Local Plan 2011-2036 (adopted 2019). [online] Available at: <https://southeastlincolnlocalplan.org/article/20102/Adopted-Plan>. [Accessed 11 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 18 October 2024].
- 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 Natural England (2024) National Character Area Profiles [online]. Available at: <https://nationalcharacterareas.co.uk/> [Accessed 20 September 2024].
- Ref 5 Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3).
- Ref 6 The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online]. Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents/made> [Accessed 06 September 2024].
- Ref 7 Natural England (2010). East Midlands Regional 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 20 September 2024].
- Ref 8 Kings Lynn and West Norfolk Borough Council (2007) Landscape Character Assessment [online] Available at: [https://www.west-norfolk.gov.uk/info/20185/planning\\_policy\\_research/383/landscape\\_character\\_assessment](https://www.west-norfolk.gov.uk/info/20185/planning_policy_research/383/landscape_character_assessment)
- Ref 9 National Grid. The Holford Rules: Guidelines on Overhead Line Routeing. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf> [Accessed 20 September 2024].
- Ref 10 National Grid. NGC Substations and the Environment: Guidelines on Siting and Design. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf> [Accessed 20 September 2024].
- Ref 11 British Standard (BS) 5837:2012: Trees in relation to Design, Demolition and Construction – Recommendations.

Ref 12 National Grid Electricity Transmission (2024). Grimsby to Walpole Corridor Preliminary Routeing and Siting Study [online]. Available at: <https://www.nationalgrid.com/document/352621/download> [Accessed 3 March 2025].

# 3. Visual

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# 3. Visual

## 3.1 Introduction

- 3.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Visual assessment for Section 5 Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 3.1.2 The assessment for Section 5 is based on a Refined Siting Zone Boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 3.1.3 Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 3.1);
  - ii. Identification of key local and regional policy relevant to the assessment (section 3.2). 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 subsequent scope of the Visual assessment (section 3.3). 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 Visual assessment within Section 5 (section 3.4). 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 Section 5 Study Area relevant to the Visual assessment (section 3.5);
  - vi. A description of mitigation measures included for the purposes of the Visual assessment reported within the PEI Report (section 3.6). 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 Visual effects arising during construction and operation of the Project within Section 5, based upon the assessment completed to date (section 3.7); and

viii. An outline of the proposed monitoring requirements in relation to Visual (section 3.8)

3.1.4 Further supporting information is set out in **Table 3.1** below, including supporting figures and technical appendices.

Table 3.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 3.1 Visual Receptors</b>
<b>PEI Report Volume 3 Part B Appendix 3A Proposed Viewpoints</b>	This appendix provides background baseline information of the representative viewpoints selected within the Study Area.
<b>PEI Report Volume 3 Part B Appendix 3B Visual Baseline</b>	This appendix provides an overview of the visual baseline, an explanation of proposed viewpoint selection and initial baseline information for the community areas within the Study Area.
<b>Project Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.



Supporting Information	Description
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 3.1.5 There are interrelationships between the potential effects on Visual 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 5 Chapter 2 Landscape** should be consulted in relation to the landscape assessment. This helps to inform judgements on the value of the views and supports the Visual assessment.
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 4 Ecology and Biodiversity** should be consulted in relation to impacts on trees and woodland. An Arboricultural Impact Assessment will be presented as an appendix to the ES and will be cross referenced in relation to impacts on trees and woodland. Both documents will be used to help inform the baseline landscape and support the assessment of visual effects reported in the ES.
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 5 Historic Environment** should be consulted in relation to historic assets including historic landscapes and Registered Parks and Gardens, which may contribute to the value of the view. This helps to inform the baseline description and supports the Visual assessment.
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement** should be consulted in relation to increased traffic flows which may influence the character of the views through noise and visual disturbance. This helps to inform the baseline description and supports the Visual assessment.
  - v. **PEI Report Volume 2 Part B Section 5 Chapter 10 Noise and Vibration** should be consulted in relation to noise intrusion which may affect the perception and value of a view. This helps to inform the baseline description and supports the Visual assessment.
  - vi. **PEI Report Volume 2 Part B Section 5 Chapter 11 Socio-economics, Recreation and Tourism** should be consulted in relation to areas of recreational importance which may contribute to the value of the view. The outputs of the visual assessment will inform the assessment of effects on recreation and tourism.

- vii. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
- viii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.

## 3.2 Legislation and Policy Framework

- 3.2.1 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** and supporting appendices, detail of which is set out **Table 3.1**.

### Regional and Local Policy

- 3.2.2 Regional and local plans or policies relevant to this assessment are as follows:
  - i. South East Lincolnshire Local Plan 2011 – 2036 (adopted 2019) (Ref 1).
    - Policy 31: Climate Change and Renewable and Low Carbon Energy. The development of renewable energy facilities associated infrastructure and the integration of decentralised technologies on existing or proposed structures will be permitted provided, individually, or cumulatively, there would be no significant harm to visual amenity (amongst other factors).

## 3.3 Scope of Assessment

- 3.3.1 The scope of the assessment 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 EIA Scoping Report (Ref 3). 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 Visual 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**.
- 3.3.2 Non statutory consultation feedback has been addressed within the **Grimsby to Walpole Non-Statutory Consultation Feedback Report**.
- 3.3.3 The scope of the construction and operation assessment covers the following receptor types:
  - i. Communities - People in communities for whom the surrounding environment is essential to their quality of life and work, including those engaging in recreational activities such as using Public Rights of Way (PRoW) and waterways; and
  - ii. Recreational Routes and Receptors - People using National Trails and regionally promoted routes, long distance cycle routes, and people at protected viewpoints,

panoramas and viewing corridors and people visiting tourist attractions where views are important to the experience.

## 3.4 Assessment Methodology

- 3.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Visual 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 described and assigned to the assessment. A summary of the key components is outlined below.

### Approach

- 3.4.2 As explained in paragraph 6.1 of GLVIA3 (Ref 4) "An assessment of visual effects deals with the effects of change and development on views available to people and their visual amenity". Changes in views can be experienced by individuals at various locations within the Study Area, including from static positions (typically assessed using representative viewpoints) and while moving through the landscape (commonly referred to as sequential views, such as those experienced from roads and footpaths).
- 3.4.3 Visual receptors are individuals or groups of people who may be affected by changes in views and visual amenity. As noted in paragraph 6.31 - 6.32 of GLVIA3 (Ref 4), they are usually grouped by their occupation or activity (e.g. residents, motorists, recreational users, tourists visiting a specific location or area) and the extent to which their attention is focused on the view.
- 3.4.4 The Visual assessment is based on communities within the jurisdiction boundaries of parishes (also referred to in this assessment as community areas) and the preliminary baseline for the community areas is presented in **PEI Report Volume 3 Part B Appendix 3B Visual Baseline**.
- 3.4.5 The Visual assessment also includes consideration of the effects on sequential views<sup>1</sup>, for example from nationally designated and regionally promoted long distance footpaths and cycleways.
- 3.4.6 The Visual assessment is informed by a series of publicly accessible viewpoint locations. These have been carefully chosen to provide a representative overview of the Project's potential visibility. Each viewpoint has been visited, with photography captured in line with TGN 06/19 to document the existing visual characteristics of Section 5. The baseline for the representative viewpoints is presented in the Visual section of **PEI Report Volume 3 Part B Appendix 3B Proposed Viewpoints**.
- 3.4.7 In accordance with GLVIA 3 (Ref 4), the assessment of visual effects involves evaluating both the nature of the visual receptors (their sensitivity) and the nature of the effects on those receptors (the magnitude of effect). These factors are then considered together to form an overall judgment regarding the significance of visual effects.
- 3.4.8 The Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** describes the methodology used

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<sup>1</sup> Views from multiple locations along a linear route such as a footpath or cycleway.

to evaluate sensitivity and magnitude and how the judgements on sensitivity and magnitude of effect are combined to make an informed professional assessment on the significance of each visual effect. A summary of the approach is set out below.

### **Establishing Visual Sensitivity**

- 3.4.9 In accordance with paragraph 6.31 of GLVIA3 (Ref 4), evaluations of the sensitivity of a visual receptor to change are based on consideration of the judgements on the value attached to the existing view (which is established and reported as part of the baseline) and the susceptibility of the receptor to changes in the view arising from the Project. These judgements are guided by the indicative criteria set out in the Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Judgements on value and susceptibility are recorded as either very high, high, medium or low.

### **Predicting the Magnitude of Change**

- 3.4.10 In accordance with paragraph 6.38 of GLVIA3 (Ref 4), judgements on the magnitude of visual change are informed by balanced consideration of the judgements on size/scale, geographical extent, duration and reversibility of the predicted change. They are guided by the indicative criteria set out in the Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. Judgements on the magnitude of visual change are recorded as large, medium, small and very small.

### **Judging Levels of Visual Effect and Significance**

- 3.4.11 The final step in the assessment requires the judgements on the sensitivity of the visual receptors and the predicted magnitude of visual change to be combined to make an informed professional assessment on the significance of each visual effect. In accordance with paragraph 6.43 of GLVIA3 (Ref 4), the evaluations of the individual aspects set out above (susceptibility, value, size and scale, geographical extent, duration and reversibility) are considered together to provide an overall profile of each identified visual effect, guided by the indicative criteria set out in the Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 3.4.12 Professional judgement and experience are applied to balance the many variables that need to be considered and given different weight according to site-specific and location-specific considerations.
- 3.4.13 Levels of visual effect are identified as major, moderate, minor, or negligible, and the direction of change as beneficial or adverse. Effects judged to be moderate or major are considered significant in the context of the EIA Regulations (Ref 5). The general approach taken to determining the significance of effect in this preliminary assessment is only to state whether effects are likely or unlikely to be significant, rather than assigning significance levels, which will be presented in the ES.

### **Assessment Assumptions and Limitations**

- 3.4.14 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.

- 3.4.15 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**. In addition to these, the following Section 5 specific Visual assessment assumptions and limitations have been applied.
- 3.4.16 As Section 5 is currently a Refined Siting Zone and the locations of the proposed substation(s) and overhead lines are unknown, a Zone of Theoretical Visibility (ZTV) has not been produced. A ZTV will be provided when more design information is provided. Please refer to **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project** for a description of what has been assessed for Section 5 in the absence of a design.

## 3.5 Baseline Conditions

### Study Area

- 3.5.1 The Study Area for the preliminary assessment is shown on **PEI Report Volume 2 Part B Section 5 Figure 3.1 Visual Receptors and Viewpoints**. The extent of the Study Area for the preliminary Visual assessment extends 5 km from Section 5.
- 3.5.2 This distance was informed by the scale and appearance of a typical 400 kilovolt (kV) substation (as detailed in **PEI Report Volume 2 Part A Chapter 5 Project Description**), field survey and professional judgment, and is considered sufficient to capture the likely significant landscape effects. Based on previous experience of similar schemes, significant impacts on the character and perception of the landscape are highly unlikely to arise beyond this distance.
- 3.5.3 A Zone of Theoretical Visibility (ZTV) map will be produced once more information on the design of the Project in Section 5 becomes available. This will inform the detailed Visual assessment which will be presented in the ES.
- 3.5.4 The preliminary cumulative Visual assessment Study Area extends 10 km from the Refined Siting Zone. This radius was established to evaluate potential cumulative landscape impacts in conjunction with other committed developments.
- 3.5.5 Further information on Study Area definition is presented in the Visual section of **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 3.5.6 To ensure that all likely significant effects are captured in the assessment, the extent of the Study Area will continue to be reviewed in the light of feedback received during statutory consultation, ongoing site surveys, and following the production of the ZTV as the Project develops.

### Data Collection

- 3.5.7 The following data has been used to inform the baseline conditions:
- i. Ordnance Survey (OS) 1:10,000, 1:25,000, 1:50,000 and 1:250,000 base mapping;
  - ii. OS Terrain® 50 mid-resolution and LIDAR Composite 2017 – 50 cm Digital Terrain Model (DTM);
  - iii. Google Earth Pro aerial photography, and Google Maps Street View;

- iv. Base mapping from ArcGIS Map Service;
  - v. Open source Geographic Information System (GIS) data;
- 3.5.8 Site surveys were carried out during several visits under differing weather conditions between spring 2023 and summer 2024.

## Existing Baseline

- 3.5.9 The following section outlines the Visual baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:
- i. **PEI Report Volume 2 Part B Section 5 Figure 3.1 Visual Receptors and Viewpoints;**
  - ii. **PEI Report Volume 3 Part B Appendix 3A Proposed Viewpoints;**
  - iii. **PEI Report Volume 3 Part B Appendix 3B Visual Baseline;** and
  - iv. **PEI Report Volume 2 Part B Figure 2.1 Landscape Designations and Features shows the distribution of woodland across the Study Area.**

## Communities

- 3.5.10 The following communities, defined by parish jurisdictional boundaries, are considered receptors within the Study Area for Section 5. The viewpoint numbers refer to the representative viewpoints used to inform the assessment.
- 3.5.11 The people within the communities listed below are considered to be highly susceptible to visual change resulting from the Project, while the characteristics of the landscape indicate that the value of the views is assessed as medium.
- i. Holbeach (VP93, VP113)
  - ii. Pinchbeck (VP83, VP85)
  - iii. Surfleet (VP82, VP83)
  - iv. The Moultons (VP90, VP91, VP115, VP118, VP119)
  - v. Weston (VP116, VP117)
  - vi. Whaplode (VP92, VP114)
- 3.5.12 Descriptions of the baseline visual amenity of these community areas are provided in **PEI Report Volume 3 Part B Appendix 3B Visual Baseline**. This includes a description of each community area and its key visual receptors and susceptibility, as well as a judgement on the value of the views currently experienced.

## Recreational Routes and Receptors

- 3.5.13 The following recreational routes are within Section 5. People using them are considered highly susceptible to visual change resulting from the Project.
- i. Greenwich Meridian Trail – A 440 km long distance trail which broadly follows the Greenwich Meridian Line between East Sussex and East Yorkshire. It crosses the Study Area in Sections 2, 4, 5 and 6. As views contribute to the landscape setting enjoyed by people using the trail, their susceptibility to the Project is high. Within Section 5, the trail crosses the Study Area between Fosdyke Bridge and Holbeach. As the trail passes beneath the existing 132 kV overhead line near Holbeach St Marks, with an existing 400 kV overhead line located to the west of Holbeach, pylons become a prominent feature in the

sequential views along the route. Their presence diminishes the scenic quality of the surrounding farmland, resulting in views of medium value within Section 5.

- ii. The Macmillan Way – A 290-mile trail from Boston to Abbotsbury in Dorset, which follows footpaths, bridleways, byways, and minor roads, showcasing diverse English landscapes. It also crosses the Study Area of Section 4 Lincolnshire Connection Substation B to Refined Weston Marsh Substation Siting Zone. In Section 5, the trail runs through South Holland’s fenland, including a scenic stretch through arable farmland from Fosdyke Bridge along the River Welland. As the trail nears Holbeach St Marks, it passes beneath the existing 132 kV overhead power line, while an existing 400 kV line crosses the farmland to the west of Holbeach. The pylons dominate the views along the route, diminishing the scenic quality of the surrounding farmland. Consequently, the views are considered to be of medium value, within Section 5.

- 3.5.14 Descriptions of the baseline visual amenity from these recreational routes is provided in **PEI Report Volume 3 Part B Appendix 3B Visual Baseline**. This includes a description of the route within the Study Area, susceptibility and the value of views.

## Future Baseline

- 3.5.15 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 the construction of the Project.
- 3.5.16 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.
- 3.5.17 Ash trees (*Fraxinus excelsior*) within the Study Area for Section 5 may be affected by ash dieback, a frequently fatal disease caused by the fungus *Hymenoscyphus fraxineus*. Therefore, the future baseline assumes long-term ash tree loss, with other species filling gaps in the short term, keeping overall vegetation levels similar. An Arboricultural Impact Assessment will record incidents of ash dieback, which in turn will inform the detailed Visual assessment presented in the ES.

## 3.6 Design, Control and Additional Mitigation Measures

### Design Mitigation Measures

- 3.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the ‘Holford Rules’ (Ref 6) applicable to routing of new overhead lines and the ‘Horlock Rules’ (Ref 7), which apply to the design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 8) 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.

- 3.6.2 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.
- 3.6.3 The Project has also committed to producing an Outline Landscape and Environmental Management Plan (LEMP) (commitment GG06), which will set out the measures to protect existing vegetation and details regarding reinstatement and additional planting. This will also account for biodiversity net gain targets (see **Volume 2 Part B Sections 1-7 Chapter 4: Ecology and Biodiversity**) and will accompany the ES and DCO application.
- 3.6.4 Due to the likely size and scale of Weston Marsh Substation A and/or Weston Marsh Substation B, as well as the relatively flat topography, it would not be feasible to completely screen the site/s from all locations. However, as part of the iterative design and assessment process, a comprehensive landscape scheme will be developed to help integrate the new infrastructure and reduce its visibility within the broader landscape. This will be presented in the ES as part of the Outline LEMP.
- 3.6.5 This will include proposals for planting native trees and shrubs around the perimeter of the substation(s), where technically feasible, taking into account the constraints of the new connections. This will help soften the site's perimeter, allowing the development to blend more naturally into the surrounding landscape while also screening views. The types and heights of trees and shrubs will be determined by local planning policy, safety clearance requirements from the proposed connections and feedback from local residents.
- 3.6.6 A detailed mitigation plan for Section 5 will be presented in the ES. This will include proposals for planting, including indicative species mixes and will be presented as part of the Outline LEMP.

## Control Mitigation Measures

### Construction

- 3.6.7 A Preliminary Code of Construction Practice (CoCP) is provided in **PEI Report Volume 3 Appendix 5A Preliminary CoCP**. The control measures included within the Preliminary CoCP relevant to the Visual assessment of Section 5 include:
  - i. 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 LEMP. 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.
- ii. LV02: The contractor(s) will apply the relevant protective principles set out in BS 5837:2012: Trees in relation to design, demolition, and construction (Ref 9). This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. An Arboricultural Clerk of Works will ensure the suitability of tree protection before and during the construction phase. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken, or supervised by a suitably qualified arboriculturist.
  - iii. 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.
  - iv. LV04: Construction lighting will be of the lowest luminosity necessary to safely perform tasks. Lighting will be directional and minimised where possible.
  - v. B08: Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance.
  - vi. 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 Construction Environmental Management Plans (CEMP).

## Additional Mitigation Measures

- 3.6.8 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.
- 3.6.9 As the location of the overhead line and substation(s) is currently unknown, no additional mitigation measures have been identified as being required for Visual in Section 5 at the time of writing this PEI Report. This will be reviewed and updated accordingly for the ES following completion of the full Visual assessment.
- 3.6.10 Any measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders, including engagement with the statutory consultees.
- 3.6.11 Finalised additional mitigation measures will be detailed within the ES.

## 3.7 Preliminary Assessment of Effects

- 3.7.1 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 and/or operational activities within Section 5.
- 3.7.2 The preliminary assessment of effects reported below takes into account the Design Mitigation Measures, Control Mitigation Measures and Additional Mitigation Measures as previously described.
- 3.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 3.2**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 3.7.4 The visual effects of maintenance activities during operation are scoped out of the assessment as agreed in the Scoping Opinion adopted by the Secretary of State on 10 September 2024 (Ref 2). As agreed in the Scoping Opinion adopted by the Secretary of State on 10 September 2024 (Ref 2), effects on people using the road or rail network or those working within the Study Area, are scoped out of the assessment as an appreciation of the wider landscape and views is generally not integral to their activities. These receptors are typically considered to have lower susceptibility to changes in the view and will often share views of the Project with receptors who have a greater susceptibility and are therefore included in the assessment in any event.
- 3.7.5 It should be noted that where an effect is reported in this PEI Report it is an adverse effect unless stated otherwise.
- 3.7.6 Reference is made in the assessment and accompanying appendices to 'direct' and 'indirect effects'. Direct effects occur within the draft Order Limits and involve physical changes to components of the landscape such as vegetation removal or presence of new structures, while indirect effects arise from the interaction between the Project and its surrounding context for example, effects on views and how they are perceived.
- 3.7.7 It is noted that this assessment 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

- 3.7.8 Changes in the character and perception of a view could occur during construction as a result of physical impacts on the landscape, including vegetation clearance and the establishment and operation of construction compounds, storage areas, access tracks, and the movement of plant (such as mobile cranes), vehicles, and personnel.

However, these effects would be temporary and reversible, with the landscape reinstated upon completion of the works<sup>2</sup>.

## Communities

- 3.7.9 Two of the six community areas have been identified as being potentially significantly affected during construction of the Project in Section 5. All other community areas would experience effects which have been judged to be not significant and are included in **Table 3.2**. There may be individual properties within community areas that would experience a greater effect from the Project. These will be identified and reported at the ES stage as part of the Residential Visual Amenity Assessment (RVAA).

### The Moultons

- 3.7.10 The Moultons Parish is located within Section 5, however a large part of the community is also located within Section 6 Refined Weston Marsh Substation Siting Zone to Walpole B Substation. The preliminary assessment of the effects on people living and moving around Weston Parish presented below considers the part of the community located within the Study Area for Section 5.
- 3.7.11 The community of The Moultons Parish is considered highly susceptible to visual change resulting from the Project, whilst the characteristics of the landscape indicate that the value of the views across the parish is judged to be medium.
- 3.7.12 This parish would be directly impacted by close proximity views of the construction of Weston Marsh Substation A and/or Weston Marsh Substation B with the associated construction compounds, haul road, and construction of the overhead line. Views out of the parish to the north and south would also be affected by construction activities associated with the proposed 400 kV overhead line in Sections 4 and 6. The works would be viewed at close range and overall, this would result in a large magnitude of change. As most of the Refined Siting Zone is in this parish, this would result in likely significant effects.
- 3.7.13 When considering the construction phase of the Project in its entirety across all Sections, the overall magnitude of predicted change remains large. This is primarily to the large-scale of the works associated with construction of the substation(s). When combined with the medium value and high susceptibility, the Project would give rise to a likely significant effect.

### Weston

- 3.7.14 Weston Parish is located within Section 5, although a large part of the community is also located within Section 6 Weston Marsh Substation Siting Zone to Walpole B Substation. The preliminary assessment of the effects on people living and moving around Weston Parish presented below considers the part of the community that is located within the Study Area for Section 5.

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<sup>2</sup> To prevent double counting, the effects resulting from vegetation loss are assessed as part of the operational phase rather than the construction phase. This approach ensures that the long-term impacts of vegetation removal on visual amenity are considered in the context of the final, post-construction condition.

- 3.7.15 The community of Weston Parish is considered highly susceptible to visual change resulting from the Project, whilst the characteristics of the landscape indicate that the value of the views across the parish is judged to be medium.
- 3.7.16 This parish would be directly impacted by close proximity views of the construction of Weston Marsh Substation A and/or Weston Marsh Substation B with the associated construction compounds, haul road, and construction of the overhead line. Views out of the parish to the north and south would also be affected by construction activities associated with the proposed 400 kV overhead line in Sections 4 and 6. The works would be viewed in at close range and overall, this could result in a large magnitude of change. As most of the Refined Siting Zone is within this parish, this would result in likely significant effects.
- 3.7.17 When considering the construction phase of the Project in its entirety across all Sections, the overall magnitude of predicted change remains large, the main potential impacts being the construction of the substation(s). This is primarily to the large-scale of the works associated with construction of the substation(s). When combined with the medium value and high susceptibility, the Project would give rise to a likely significant effect.

#### Recreational Routes and Receptors

- 3.7.18 No significant effects for recreational routes or receptors have been identified in Section 5 during construction. Effects which have been judged to be not significant are included in **Table 3.2**.

#### Operation

- 3.7.19 The potential impacts that could result from the operation of the Project are the changes to the composition, character and perception of views due to long-term loss of elements and features in the landscape, changes to the landform, introduction of new infrastructure and introduction of landscape elements such as trees and hedgerows. The effects would be long-term and are considered permanent.

#### Communities

- 3.7.20 Two of the six community areas have been identified as being potentially significantly affected during operation of the Project in Section 5. All other community areas would experience effects which have been judged to be not significant and are included in **Table 3.2**. There may be individual properties within community areas that would experience a greater effect from the Project. These will be identified and reported at the ES stage as part of the RVAA.

#### The Moultons

- 3.7.21 The Moultons Parish is located within Section 5, although a large part of the community is also located within Section 6 Weston Marsh to Walpole Substation B. The preliminary assessment of the effects on people living and moving around The Moultons Parish presented below considers the part of the Community that is located within the Study Area for Section 5.
- 3.7.22 The community of The Moultons Parish is considered highly susceptible to visual change resulting from the Project, whilst the characteristics of the landscape indicate that the value of the views across the parish is judged to be medium.

3.7.23 The parish may experience direct impacts from the new overhead line and Weston Marsh Substation A and/or Weston Marsh Substation B, potentially resulting in close proximity views of the Project. Additionally, the parish would be indirectly affected by the visibility of the overhead line in Section 4. While views are already influenced by the existing 400 kV overhead line to the west, the Project may extend the area affected by overhead line infrastructure, increasing the number of visible pylons for residents and those moving through the parish. The new 400 kV overhead line would be noticeable in views across the central part of the community area. Overall, this would result in a medium magnitude of change and likely significant effects. When considering the operation phase of the Project in its entirety across all Sections, the overall magnitude of predicted change remains medium. Although Weston Marsh Substation A and/or Weston Marsh Substation B may be located within this parish, mitigation planting would be included in the design help to screen views from visual receptors within the community. When combined with the medium value and high susceptibility, the Project would give rise to a likely significant effect.

#### Weston

3.7.24 Weston Parish is located within Section 5, although a large part of the community is also located within Section 6 Weston Marsh to Walpole Substation B. The preliminary assessment of the effects on people living and moving around Weston Parish presented below considers the part of the community that is located within the Study Area for Section 5.

3.7.25 The community of Weston Parish is considered highly susceptible to visual change resulting from the Project, whilst the characteristics of the landscape indicate that the value of the views across the parish is judged to be medium.

3.7.26 The parish would be directly impacted by the presence of approximately 5-6 km of overhead line and Marsh Substation A and/or Weston Marsh Substation B, potentially resulting in close proximity views of the Project. Most of the Refined Siting Zone is located within this community area so effects are likely. While views are already influenced by the existing 400 kV overhead lines, the Project may extend the area affected by overhead line infrastructure, increasing the number of visible pylons for residents and those moving through the parish. The new 400 kV overhead line and the substation(s) would be noticeable in views across the central part of the community area. Overall, this would result in a medium magnitude of change and likely significant effects.

3.7.27 Although views are already affected by the existing 400 kV overhead lines, the Project would spread the effects of overhead line infrastructure across a wider area and increase the numbers of pylons visible for people living and moving around the parish. The new 400 kV overhead line and substation(s) would be noticeable in views in the central part of this community area. While proposed mitigation planting would help screen and soften views of the substation(s), they would potentially remain a new discordant feature. Overall, this would result in a medium magnitude of change and likely significant effects.

3.7.28 When considering the operation phase of the Project in its entirety across all Sections, the overall magnitude of predicted change remains medium. While Weston Marsh Substation A and/or Weston Marsh Substation B may be situated within this parish, the inclusion of mitigation planting in the design would help screen views from visual receptors within the community. When combined with the medium value and high susceptibility, the Project would give rise to a likely significant effect.

## Recreational receptors

- 3.7.29 No significant effects for recreational routes or receptors have been identified in Section 5 during operation. Effects which have been judged to be not significant are included in **Table 3.2**.

## Likely Non-Significant Effects

- 3.7.30 For completeness, **Table 3.2** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Visual effects.
- 3.7.31 There are some visual receptors where the effects are likely to be not significant when considering only impacts within Section 5, however when considering the Project in its entirety would result in a likely significant effect. For those receptors, additional information is presented below to describe the effects in Section 5 and which other Sections of the Project would result in a greater effect.

## Construction

### Greenwich Meridian Trail

- 3.7.32 The Greenwich Meridian Trail is located within Section 5 and is also located within Section 2 Grimsby West Substation to Lincolnshire Connection Substation A, Section 4 Lincolnshire Connection Substation B to Refined Weston Marsh Siting Zone and Section 6 Refined Weston Marsh Siting Zone to Walpole B Substation. The preliminary assessment of the effects on people using the Greenwich Meridian Trail presented below only considers the effects of the Project in Section 5.
- 3.7.33 People using the Greenwich Meridian Trail have a high susceptibility to change arising from the Project while the characteristics of the landscape in Section 5 indicate that the value of the sequential views experienced is judged to be medium. Due to the flat landform and intervening vegetation cover, views of construction activities would be limited. While taller equipment may be visible from a distance, these views would not be in close proximity and would be temporary in nature. As a result, the magnitude of change would be very small. When combined with the medium value and high susceptibility, the Project would not give rise to a likely significant effect.
- 3.7.34 When considering the construction phase of the Project in its entirety across all Sections, the overall magnitude of predicted change would increase to medium. This is mainly due to the close proximity of the route to construction activities in Section 6, as trail users are unlikely to encounter construction activities in multiple sections of the route within a short timeframe, given the distances between sections. When combined with the medium value and high susceptibility, the Project would give rise to a likely significant effect.

## Operation

### Whaplode

- 3.7.35 Whaplode Parish is located within Section 5, although a large part of the community, is also located within Section 6 Weston Marsh Substation Siting Zone to Walpole Substation B.

- 3.7.36 The preliminary assessment of the effects on people living and moving around Whapolde Parish presented below considers the part of the community that is located within the Study Area for Section 5.
- 3.7.37 The community of Whaplode Parish is considered highly susceptible to visual change resulting from the Project, whilst the characteristics of the landscape indicate that the value of the views across the parish is judged to be medium.
- 3.7.38 The parish would be indirectly impacted by the operation of the overhead line to the west. However, views are already affected by the existing 400 kV overhead lines, so the Project would be seen in this context. The magnitude of change is considered to be small. When combined with the medium value and high susceptibility, the Project is unlikely to give rise to a likely significant effect.
- 3.7.39 When considering the operation phase of the Project in its entirety across all Sections, the overall magnitude of predicted change increases to medium. This is due to the effects associated within Section 6 where the Project crosses this community and would therefore be visible in close proximity. When combined with the medium value and high susceptibility, the Project would give rise to a likely significant effect.

Table 3.2 Preliminary summary of non-significant Visual effects – Section 5

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
<b>Communities</b>					
Holbeach (VP93, VP113)	Value of Views – Medium Susceptibility – High	Indirectly affected by views of construction activities associated with overhead line and substation(s) in Section 5. Indirectly affected by the presence of pylons in Section 5.	Construction – very small	Construction – not significant	The flat landscape means that the visual effects would be confined to occasional glimpses of the taller equipment associated with the works. These views would not be from close proximity, and the effects would be temporary.  The magnitude of change is considered to be very small and effects on this community area during construction are unlikely to be significant.
			Operation – small	Operation – not significant	At 3.8 km distance, the new overhead line may be perceptible but would be seen in the context of the existing 400 kV overhead line. The Project would not fundamentally alter the composition or character of the views currently experienced.  The magnitude of change is considered to be small and effects on this community area during operation are unlikely to be significant.
Pinchbeck (VP83, VP85)	Value of Views – Medium Susceptibility – High	Indirectly affected by views of construction activities and presence of pylons during operation in Section 5 and 6.	Construction – small	Construction – not significant	The tops of the taller construction equipment may be perceptible but would be temporary in nature and seen at a distance. There may be views across the River Welland towards the construction activities associated with the



Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
					<p>substation(s) but only from the most northern part of the parish.</p> <p>The magnitude of change is considered to be small and effects on this community area during construction are unlikely to be significant.</p>
			Operation – small	Operation – not significant	<p>The taller components of the Project may be perceptible but would be seen in the context of the existing 400 kV overhead lines. Therefore the Project would not fundamentally alter the composition or character of the views currently experienced. Mitigation planting around the substation(s) would over time help to screen and filter views.</p> <p>The magnitude of change is considered to be small and effects on this community area during operation are unlikely to be significant.</p>
Surfleet (VP82, VP83)	Value of Views – Medium Susceptibility - High	Indirectly affected by views of construction activities and presence of pylons in Sections 4 and 5.	Construction – small	Construction – not significant	<p>Although there would be open views of construction activity to the east of this large community area, the flat landscape means that the visual effects would be confined to occasional glimpses of the taller equipment associated with the works. These views would not be from close proximity, and the effects would be temporary. The visual effects of access routes would be limited to the immediate fields.</p> <p>The magnitude of change is considered to be small and effects on this community area</p>

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
					during construction are unlikely to be significant.
			Operation – small	Operation - not significant	<p>The new 400 kV overhead line would be noticeable in views to the east. These views are already affected by the existing 4ZM overhead line, which the Project parallels, and therefore the Project would not fundamentally alter the composition or character of the views currently experienced. From most of the community area, the Project would be seen beyond the existing overhead line, which would remain the more prominent feature.</p> <p>The magnitude of change is considered to be small and effects on this community area during operation are unlikely to be significant.</p>
Whaplode (VP92, VP114)	Value of Views – Medium Susceptibility – High	Indirectly affected by construction and operation of new overhead line to the west.	Construction –very small	Construction – not significant	<p>Due to the flat landform, views of construction activities would be limited. Visual effects would be confined to occasional glimpses of the taller equipment associated with the works. These views would not be from close proximity, and the impact would be temporary. The magnitude of change is considered to be very small and effects on this community area during construction are unlikely to be significant.</p>
			Operation - small	Operation - not significant	Views are already affected by the existing 400 kV overhead lines and therefore the Project would not fundamentally alter the composition

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
					<p>or character of the views currently experienced.</p> <p>The magnitude of change is considered to be small and effects on this community area during operation are unlikely to be significant.</p>
<b>Recreational Routes and Receptors</b>					
Greenwich Meridian Trail	Value of Views – Medium Susceptibility – High	Indirectly affected by construction and operation of pylons and substation(s) in Section 5.	Construction – very small	Construction – not significant	<p>Due to the flat landform, views of construction activities would be limited. There may be glimpses of taller equipment associated with the works, however not in close proximity and would be temporary in nature.</p> <p>The magnitude of change is considered to be very small and effects on this community area during construction are unlikely to be significant.</p>
			Operation – very small	Operation – not significant	<p>At 5 km, the new overhead line may be perceptible but seen in the context of the existing 400 kV overhead line. The Project would not fundamentally alter the composition or character of the views currently experienced.</p> <p>The magnitude of change is considered to be very small and effects on this community area during operation are unlikely to be significant.</p>
MacMillan Way	Value of Views – Medium	Indirectly affected by construction in Section 4 and Section 5, the route crosses the Project	Construction – small	Construction – not significant	<p>Although in close proximity, views of access roads and working areas associated with the proposed 400 kV overhead line in Section 4 would be filtered by vegetation along the</p>

Receptor	Value of Views and Susceptibility of Receptor	Impact	Magnitude of Change	Significance	Rationale
	Susceptibility – High	between pylons LW199 and the Refined Weston Marsh Siting Zone.			<p>River Welland. These views would be experienced transiently and from a short section of the route. Taller equipment may be visible above the intervening vegetation and at some distance, but its effect on views would be temporary.</p> <p>The magnitude of change is considered to be small and effects on people using the footpath during construction are unlikely to be significant.</p>
		Indirectly affected by the presence of pylons in Section 4 and Section 5, the route crosses the Project between pylons LW199 and the Refined Weston Marsh Siting Zone.	Operation - small	Operation - not significant	<p>Although the Project would introduce new pylons into views from the Macmillan Way along the boundary between Sections 4 and 5, pylons are not an unusual feature in the area, as the existing 400 kV overhead line already crosses these sections of the footpath.</p> <p>The magnitude of change is considered to be small and effects on people using the footpath during operation are unlikely to be significant.</p>

## **3.8 Monitoring**

- 3.8.1 No landscape monitoring is currently proposed for Section 5, as it is only necessary to ensure the establishment of mitigation planting. A five-year aftercare period for mitigation planting is secured through the Preliminary CoCP.

# References

- Ref 1 South East Lincolnshire Joint Strategic Planning Committee (2019). South East Lincolnshire Local Plan 2011-2036 (adopted 2019). [online] Available at: <https://southeastlinclslocalplan.org/article/20102/Adopted-Plan>. [Accessed 11 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 18 October 2024].
- 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 Landscape Institute and Institute for Environmental Management and Assessment (IEMA) (2013) Guidelines for Landscape and Visual Impact Assessment – 3rd Edition (GLVIA3).
- Ref 5 His Majesty’s Stationary Office (HMSO) (2017), Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (EIA Regulations) [online] Available at: <https://www.legislation.gov.uk/ukxi/2017/572/contents> [Accessed 20 September 2024].
- Ref 6 National Grid. The Holford Rules: Guidelines on Overhead Line Routeing. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf> [Accessed 20 September 2024].
- Ref 7 National Grid. NGC Substations and the Environment: Guidelines on Siting and Design. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf> [Accessed 20 September 2024].
- Ref 8 National Grid Electricity Transmission (2024). Grimsby to Walpole Corridor Preliminary Routeing and Siting Study [online]. Available at: <https://www.nationalgrid.com/document/352621/download> [Accessed 3 March 2025].
- Ref 9 British Standard (BS) 5837:2012: Trees in relation to Design, Demolition and Construction – Recommendations.

# 4. Ecology and Biodiversity

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# 4. Ecology and Biodiversity

## 4.1 Introduction

- 4.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Ecology and Biodiversity assessment Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 4.1.2 The assessment for Section 5 is based on a Refined Siting Zone boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 4.1.3 Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 4.1);
  - ii. Identification of key local and regional policy relevant to the assessment (section 4.2). 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 Ecology and Biodiversity assessment (section 4.3). 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 Ecology and Biodiversity assessment within Section 5 (section 4.4). 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 Section 5 Study Area relevant to the assessment (section 4.5);
  - vi. A description of mitigation measures included for the purposes of the Ecology and Biodiversity assessment reported within the PEI Report (section 4.6). 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 Ecology and Biodiversity effects arising during construction and operation/maintenance of the Project within Section 5, based upon the assessment completed to date (section 4.7); and

viii. An outline of the proposed monitoring requirements in relation to Ecology and Biodiversity (section 4.8).

4.1.4 Further supporting information is set out in **Table 4.1** below, including supporting figures and technical appendices.

Table 4.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 4.1 Sites Statutorily Designated for their International Biodiversity Importance</b> <b>Figure 4.2 Sites Statutorily designated for their National and County Biodiversity Importance</b> <b>Figure 4.3 Sites Statutorily designated for their County Biodiversity Importance</b>
<b>PEI Report Volume 3 Part B Section 5 Appendix 4A Bird Survey Data 2022-24</b>	Reports the suite of bird survey data collected at the time of the PEI Report production, including species recorded and counts.
<b>Project Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	A summary of the main alternatives considered in relation to the Project during the design

Supporting Information	Description
PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information	development process, including the main reasons for selecting the chosen option.
PEI Report Volume 2 Part A Chapter 5 Project Description	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 3 Part A Appendix 5A Preliminary Code of Construction Practice	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 final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 4.1.5 There are also interrelationships between the potential effects on Ecology and Biodiversity 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 5 Chapter 6 Water Environment and Flood Risk** includes an assessment of effects upon sensitive surface water features, including Water Framework Directive (WFD) waterbodies, which are relevant to the assessment of impacts upon important ecological features, such as wetland Habitats of Principal Importance (HPI) and aquatic fauna.
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology** includes effects identified by the geology and hydrogeology assessment that may affect ecological receptors.
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 8 Agriculture and Soils** includes details of Agri-environment and Woodland and Forestry schemes, as well as relevant factors related to soil ecosystem services.
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 10 Noise and Vibration** includes detail of the potential noise and vibration effects within Section 5 which are used to inform assessment of effects upon sensitive ecological features.
  - v. **PEI Report Volume 2 Part B Section 5 Chapter 12 Air Quality** includes detail of the potential impacts of any changes in air quality upon sensitive ecological features, such as designated sites and ancient woodland.
  - vi. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
  - vii. **PEI Report Volume 2 Part C Route-wide Chapter Ecology and Biodiversity** presents a summary of the route-wide preliminary impacts and likely significant effects of the Project upon the ecology and biodiversity.

- viii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.

## 4.2 Legislation and Policy Framework

### Legislation and National Policy

- 4.2.1 Legislation and national policy relevant to the Project and this chapter are described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy Context** and supporting appendices, detail of which is set out in **Table 4.1**.

### Regional and Local Policy

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

- i. South East Lincolnshire Local Plan 2011-2036 (Ref 1):
  - Policy 28 The Natural Environment: supports protecting, managing and enhancing a high quality, comprehensive ecological network of interconnected designated sites, sites of nature conservation importance and wildlife-friendly greenspace.
  - Policy 31 Climate Change and Renewable and Low Carbon Energy: notes that all development proposals will be required to demonstrate that the consequences of current climate change have been addressed, minimised and mitigated by (amongst other measures) incorporating measures which promote and enhance green infrastructure and provide an overall net gain in biodiversity. This policy also stipulates that the development of renewable energy facilities and associated infrastructure will be permitted provided that individually or cumulatively, there would be no significant harm to the natural environment.

### Biodiversity Net Gain

- 4.2.3 National Grid Electricity Transmission plc (National Grid) has committed to 10 per cent net gain in environmental value, including as a minimum a 10 per cent Biodiversity Net Gain (BNG) across all its construction projects, in line with the Environment Act 2021 (although the statutory requirement is not yet in force for Nationally Significant Infrastructure Projects (NSIPs)).

## 4.3 Scope of Assessment

- 4.3.1 The scope of the assessment for Ecology and Biodiversity 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 EIA Scoping Report (Ref 3). 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 Ecology and Biodiversity

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**.

4.3.2 Non statutory consultation feedback has been addressed in the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.

4.3.3 The scope of the Ecology and Biodiversity assessment for Section 5 includes the consideration of the effects of construction and operation/maintenance of the Project. A summary of the sensitive receptors and potential impacts considered is provided below:

- i. Sites statutorily designated for their biodiversity value – habitat loss, habitat modification/degradation, fragmentation, and direct and indirect changes in surface water quality and quantity, and effects on qualifying features/notified species;
- ii. Sites non-statutorily designated for their biodiversity value – habitat loss, habitat modification/degradation, fragmentation and direct and indirect changes in surface water quality and quantity, and effects on qualifying features/notified species;
- iii. Ancient Woodland - habitat loss, habitat modification and fragmentation and change in surface water quality;
- iv. Aquatic and terrestrial habitats present within the Ecology and Biodiversity Study Area, including HPI - habitat loss, habitat modification, fragmentation and change to surface water quality or flows;
- v. Protected or notable species (e.g. Species of Principal Importance (SPIs)) which are either confirmed present or potentially present within the Section 5 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;
  - reptiles;
  - wintering birds;
  - breeding birds;
  - badger;
  - bats;
  - otter;
  - water vole;
  - fish;
  - aquatic macroinvertebrates and macrophytes; and
  - other notable species such as brown hare or hedgehog.

- vi. invasive non-native species (INNS) – risk of spread due to construction and operational/maintenance activities and influence of presence upon habitat condition.

## 4.4 Assessment Methodology

- 4.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Ecology and Biodiversity assessment are set out in **PEI Report Volume 3 Part A Appendix 4B EIA 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 of the assessments, assumptions and limitations is outlined below.
- 4.4.2 The Ecology and Biodiversity assessment is being undertaken principally with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland Terrestrial, Freshwater, Coastal and Marine (Ref 4).
- 4.4.3 Where possible, nationally recognised standard survey methods have and will continue to be used to inform biodiversity evaluation and impact assessment. The explanation of the methods and status of surveys are summarised in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 4.4.4 The current assessment presented in this PEI Report is preliminary and is likely to be subject to change as more detailed baseline data becomes available, such as completed ecological survey results. Additionally, the design will also be subject to further refinement prior to submission of the ES. On this basis, a precautionary approach has been taken to the preliminary assessment.

## Assessment Assumptions and Limitations

- 4.4.5 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 4.4.6 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**.
- 4.4.7 The key parameters and assumptions which inform the assessment 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 applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

## 4.5 Baseline Conditions

### Study Areas and Survey Areas

- 4.5.1 The desk Study Areas for the Ecology and Biodiversity assessment of Section 5 have been informed by published guidance and professional judgement. They include the

area within Section 5 and a wider zone of potential influence. This zone represents the areas within which effects could reasonably occur as a result of the Project and associated activities. It should be noted that in relation to each assessed receptor, the Project's zone of influence can vary, for example depending on the importance or sensitivity of the identified designated ecological sites. This could for example relate to where the features that define a given site are mobile or there could be connectivity between the proposed Project and a given site. The Study Areas will be reviewed and, as appropriate, refined for the assessment presented in the ES.

- 4.5.2 The desk Study Areas for different ecological features (hereafter referred to as 'the Study Areas') relevant to this assessment are set out in **Table 4.2** below.
- 4.5.3 The field Survey Areas for the Ecology and Biodiversity assessment of Section 5 have also been informed by published guidance and professional judgement. As with the desk Study Areas, the Survey Areas are defined on a case-by-case basis and differ for each of the ecological features surveyed. The Survey Areas typically include land within the Refined Siting Area (i.e. within the 'Site' boundary) plus wider areas within the Zone of Influence, where the Project could result in impacts upon habitats or species.
- 4.5.4 The field Survey Areas for different ecological features (hereafter referred to as 'the Survey Areas') relevant to this assessment, including associated methods and status of surveys, are set out in **Table 4A.1** in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

**Table 4.2 Study Areas for key ecological features for Section 5**

<b>Study Area (distance from the Refined Siting Zone)</b>	<b>Feature</b>
30 km	Special Areas of Conservation (SAC), Special Protection Areas SPA and Ramsar sites where bats or bird species with large foraging ranges are noted as, or one of, the qualifying features.
10 km	Statutory designated sites of international nature conservation importance e.g. SAC, SPA and Ramsar sites (as well as proposed or potential sites).
5 km	Statutory designated sites of national and local nature conservation importance e.g. Sites of Special Scientific Interest (SSSI) (also referencing Natural England Impact Risk Zones for SSSIs on the 'Multi-Agency Geographic Information for the Countryside' (MAGIC) website (Ref 5), National Nature Reserves (NNR) and Local Nature Reserves (LNRs)).
5 km	Specific ornithological records and data for wetland birds from the British Trust for Ornithology (BTO) Wetland Birds Survey (WeBS).
2 km	Non-statutory designated sites of nature conservation value e.g. Local Wildlife Sites (LWS), Roadside Nature Reserves (RNR), ancient woodland and other notable habitats (e.g. HPI's (Ref 6)).

Study Area (distance from the Refined Siting Zone)	Feature
2 km	Records of protected and notable species received from Local Environmental Records Centres (LERC), including general ornithological records and INNS.

## Data Collection

- 4.5.5 Desk study data sources have comprised LERCs, including requests to Greater Lincolnshire Nature Partnership (GLNP) (initially contacted in March 2024) for information on pre-existing ecological data (i.e. locations of non-statutory sites designated for nature conservation, existing records of protected, notable and INNS).
- 4.5.6 Online data resources have comprised:
- i. the Natural England website (Ref 7) for information on statutory designated sites of nature conservation interest;
  - ii. the MAGIC website (Ref 5) to identify the location (and details) of statutorily designated sites, ancient woodland, HPI (including Priority River Habitat) and for any granted European Protected Species Licence applications;
  - iii. the Joint Nature Conservation Committee (JNCC) website (Ref 8) for site information and designation details of SACs, SPAs and Ramsar sites;
  - iv. aerial imagery (Google Maps);
  - v. Environment Agency (EA) Ecology and Fish Data for species records of fish, macroinvertebrate and macrophytes species (Ref 9); and
  - vi. EA Catchment Data Explorer for data on WFD water bodies and water catchments (Ref 10).
- 4.5.7 In addition to these desk-based data, site survey data are in the process of being collected, and this work is on-going. Apart from pre-construction surveys and those specifically required to collect data to inform any applications for protected species licences, these surveys are anticipated to be complete by the end of 2025. Once planned surveys to support the DCO application are complete, the results will be collated with the survey data already collected to date, for inclusion within the ES to be submitted with the DCO application (see **PEI Report Volume 2 Part A Appendix 4B Environmental Impact Assessment Methodology and Scope** for a summary of surveys undertaken and those planned for 2025).
- 4.5.8 Features of ecological importance are in the process of being assessed. The data available at the time of writing this PEI Report varies for any given ecological feature, dependent on the extent of surveys undertaken. This is due to specific survey requirements (such as optimal timing of surveys) and/or where only partial access to land has been secured in advance of the PEIR being developed. The survey data being collected is as follows:
- i. Habitat survey and assessments, using the UK Habitat (Ref 11) Classification for terrestrial habitats and BNG condition assessments for applicable habitats;



- ii. Aquatic habitat surveys results including an appraisal for suitability for fish, aquatic macrophytes and aquatic macroinvertebrates;
- iii. Results from protected species surveys:
  - great crested newt;
  - reptiles;
  - wintering birds;
  - breeding birds;
  - badger;
  - bats;
  - otter; and
  - water vole.
- iv. INNS surveys.

4.5.9 Incidental records of other notable species such as brown hare and hedgehog have also been recorded.

4.5.10 In addition to the above, arboricultural surveys are being undertaken in 2025. The results of which will be integrated into the ecological data collected for habitats (i.e. hedges, trees and woodland) and included within the ES.

## Existing Baseline

4.5.11 The following section outlines the Ecology and Biodiversity baseline to date. The baseline section should be read in conjunction with the following supporting Figure and Appendices as found within PEI Report **Volume 2** and **Volume 3** respectively.

- i. **PEI Report Volume 2 Part B Section 5 Figure 4.1 Sites Statutorily Designated for their International Biodiversity Importance;**
- ii. **PEI Report Volume 2 Part B Section 5 Figure 4.2 Sites Statutorily Designated for their National and County Biodiversity Importance;**
- iii. **PEI Report Volume 2 Part B Section 5 Figure 4.3 Sites Statutorily Designated for their County Biodiversity Importance;** and
- iv. **PEI Report Volume 3 Part B Section 5 Appendix 4A Bird Survey Data 2022-2024.**

## Section Overview

4.5.12 A description of the works within Section 5 is provided within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**. The details of proposed permanent works within Section 5 are subject to ongoing siting and design work. However up to two new 400 kV substation(s) are proposed (to be referred to as Weston Marsh Substation A and Weston Marsh Substation B), along with an associated overhead line between the two, in the vicinity of the Spalding Tee-Point, which is approximately 2.5km east of the village of Surfleet Seas End. Connecting transmission infrastructure will continue from Section 4, from

north of the River Welland, and is anticipated to be routed in a southerly direction towards Weston, where it will connect with overhead line in Section 6.

- 4.5.13 Section 5 is located within South Holland local planning authority area, the start point of which is located approximately 7 km north-east of Spalding and the end point of which is located approximately 2.5 km north-east of Spalding.
- 4.5.14 The habitats within the Section 5 Study Area are dominated by arable farmland divided by a network of boundary hedgerows and ditches, with small woodlands also scattered across the area. There are a number of water bodies located within the Section 5 Study Area, including the River Welland, which would be crossed by overhead line near the connection with Section 4.

### **Designated Sites**

- 4.5.15 No site (nor part of any site) statutorily designated for its biodiversity importance is present within the Refined Siting Zone. There are however a number of statutory designated sites present within the defined Study Areas described in **Table 4.2**. A brief description of each of the designated sites within the Section 5 Study Area is provided in **Table 4.3**, which includes a summary of the main qualifying features and their relative distances from the Refined Siting Zone at the closest point.
- 4.5.16 The Wash SPA and Ramsar site and The Wash and North Norfolk Coast SAC fall within 10 km of the Refined Siting Zone. In addition, Nene Washes SPA and Ramsar site, where bird species with large foraging ranges are noted as, or one of, the qualifying features, fall within 30 km of the Refined Siting Zone.
- 4.5.17 There are two SSSIs and one LNRs within the Study Area (i.e. within 5 km of the Refined Siting Zone and/or where the SSSI Impact Risk Zones (IRZ's) overlap). The IRZ's for Surfleet Lows SSSI and The Wash SSSI partially overlap with the Refined Siting Zone.
- 4.5.18 There are 15 sites non-statutorily designated for their biodiversity value as Local Wildlife Sites (LWSs) within the 2 km Study Area, three of which are located within or within 0.1 km of the Refined Siting Zone of Section 5: Surfleet Bank LWS and Surfleet Seas End Saltmarsh LWS and Vernatt's Drain LWS.

Table 4.3 Sites statutorily designated for their biodiversity value, their qualifying features and distance from the Refined Siting Zone

Site	Status	Area (ha)	Brief description of site	Distance and direction from Refined Siting Zone
<b>Internationally Designated (Statutory)</b>				
Nene Washes	SPA	1,519	Qualifying features of the SPA: <ul style="list-style-type: none"> <li>• Bewick's swan (<i>Cygnus columbianus bewickii</i>) – non-breeding</li> <li>• Black-tailed godwit (<i>Limosa limosa limosa</i>) – breeding</li> <li>• Gadwall (<i>Mareca strepera</i>) – breeding</li> <li>• Gadwall (<i>Mareca strepera</i>) – non-breeding</li> <li>• Garganey (<i>Anas querquedula</i>) – breeding</li> <li>• Pintail (<i>Anas acuta</i>) – non-breeding</li> <li>• Shoveler (<i>Spatula clypeata</i>) – breeding</li> <li>• Shoveler (<i>Spatula clypeata</i>) – non-breeding</li> <li>• Teal (<i>Anas crecca</i>) – non-breeding</li> <li>• Wigeon (<i>Mareca penelope</i>) – non-breeding</li> </ul>	24.2 km south
Nene Washes	Ramsar site	1,519	Designated under: <p><b>Ramsar Criterion 2:</b> Important assemblage of nationally rare breeding birds. A wide range of raptors throughout the year. Nationally scarce plants and invertebrates.</p> <p><b>Ramsar Criterion 6:</b> Species/populations occurring at levels of international importance.</p> Species with peak counts in winter: <ul style="list-style-type: none"> <li>• Bewick's swan (<i>Cygnus columbianus bewickii</i>)</li> </ul>	24.2 km south

Site	Status	Area (ha)	Brief description of site	Distance and direction from Refined Siting Zone
			<p><b>Species/populations identified subsequent to designation for possible future consideration under Criterion 6</b></p> <p>Species with peak counts in spring/autumn:</p> <ul style="list-style-type: none"> <li>• Black-tailed godwit (<i>Limosa limosa islandica</i>)</li> </ul> <p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>• Northern pintail (<i>Anas acuta</i>)</li> </ul>	
The Wash	SPA	63,135	<p>Qualifying features of the SPA:</p> <ul style="list-style-type: none"> <li>• Bar-tailed godwit (<i>Limosa lapponica</i>) – non-breeding</li> <li>• Bewick's swan (<i>Cygnus columbianus</i>) – non-breeding</li> <li>• Black-tailed godwit (<i>Limosa limosa islandica</i>) – non-breeding</li> <li>• Common scoter (<i>Melanitta nigra</i>) – non-breeding</li> <li>• Common tern (<i>Sternula hirundo</i>) - breeding</li> <li>• Curlew (<i>Numenius arquata</i>) – non-breeding</li> <li>• Dark-bellied brent goose (<i>Branta bernicla bernicla</i>) – non-breeding</li> <li>• Dunlin (<i>Calidris alpina alpina</i>) – non-breeding</li> <li>• Gadwall (<i>Mareca strepera</i>) – non-breeding</li> <li>• Wigeon (<i>Mareca penelope</i>) – non-breeding</li> <li>• Goldeneye (<i>Bucephala clangula</i>) – non-breeding</li> <li>• Grey plover (<i>Pluvialis squatarola</i>) – non-breeding</li> <li>• Knot (<i>Calidris canutus</i>) – non-breeding</li> <li>• Little tern (<i>Sternula albifrons</i>) - breeding</li> <li>• Oystercatcher (<i>Haematopus ostralegus</i>) – non-breeding</li> </ul>	4.5 km north-east

Site	Status	Area (ha)	Brief description of site	Distance and direction from Refined Siting Zone
			<ul style="list-style-type: none"> <li>• Pink-footed goose (<i>Anser brachyrhynchus</i>) – non-breeding</li> <li>• Pintail (<i>Anas acuta</i>) – non-breeding</li> <li>• Redshank (<i>Tringa totanus</i>) – non-breeding</li> <li>• Sanderling (<i>Calidris alba</i>) – non-breeding</li> <li>• Shelduck (<i>Tadorna tadorna</i>) – non-breeding</li> <li>• Turnstone (<i>Arenaria interpres</i>) – non-breeding</li> <li>• Waterbird assemblage.</li> </ul>	
The Wash	Ramsar site	63,135	<p>Designated under:</p> <p><b>Ramsar Criterion 1:</b> Large shallow bay comprising very extensive saltmarshes, major intertidal banks of sand and mud, shallow water and deep channels.</p> <p><b>Ramsar Criterion 3:</b> Inter-relationship between saltmarshes, intertidal sand and mud flats and the estuarine waters. The saltmarshes and the plankton in the estuarine water provide a primary source of organic material which, together with other organic matter, forms the basis for the high productivity of the estuary.</p> <p><b>Ramsar Criterion 5:</b> Assemblages of international importance</p> <p>Species with peak counts in winter:</p> <p>292541 waterfowl (5 year peak mean 1998/99-2002/2003)</p> <p><b>Ramsar Criterion 6:</b> species/populations occurring at levels of international importance.</p> <p>Species with peak counts in spring/autumn:</p> <ul style="list-style-type: none"> <li>• Oystercatcher (<i>Haematopus ostralegus</i>) – Wintering</li> <li>• Grey plover (<i>Pluvialis squatarola</i>) - Wintering</li> </ul>	4.5 km north-east

Site	Status	Area (ha)	Brief description of site	Distance and direction from Refined Siting Zone
			<ul style="list-style-type: none"> <li>• Knot (<i>Calidris canutus</i>) – Wintering</li> <li>• Sanderling (<i>Calidris alba</i>)</li> <li>• Curlew (<i>Numenius arquata arquata</i>) – Breeding</li> <li>• Redshank (<i>Tringa totanus</i>)</li> <li>• Turnstone (<i>Arenaria interpres</i>)</li> </ul> <p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>• Pink-footed goose (<i>Anser brachyrhynchus</i>)</li> <li>• Dark-bellied brent goose (<i>Branta bernicla</i>)</li> <li>• Shelduck (<i>Tadorna tadorna</i>)</li> <li>• Pintail (<i>Anas acuta</i>)</li> <li>• Dunlin (<i>Calidris alpina</i>)</li> <li>• Bar-tailed godwit (<i>Limosa lapponica</i>)</li> </ul> <p><b>Species/populations identified subsequent to designation for possible future consideration under Criterion 6</b></p> <p>Species with peak counts in spring/autumn:</p> <ul style="list-style-type: none"> <li>• Ringed plover (<i>Charadrius hiaticula</i>)</li> <li>• Black-tailed godwit (<i>Limosa limosa islandica</i>)</li> </ul> <p>Species with peak counts in winter:</p> <ul style="list-style-type: none"> <li>• Golden plover (<i>Pluvialis apricaria</i>)</li> <li>• Northern lapwing (<i>Vanellus vanellus</i>)</li> </ul>	
The Wash and North Norfolk Coast	SAC	107,718	<p>Designated features of the SAC:</p> <ul style="list-style-type: none"> <li>• H1110 Sandbanks which are slightly covered by sea water all the time</li> </ul>	4.5 km east

Site	Status	Area (ha)	Brief description of site	Distance and direction from Refined Siting Zone
			<ul style="list-style-type: none"> <li>• H1140 Mudflats and sandflats not covered by seawater at low tide</li> <li>• H1150 Coastal lagoons</li> <li>• H1160 Large shallow inlets and bays</li> <li>• H1170 Reefs</li> <li>• H1310 Salicornia and other annuals colonising mud and sand</li> <li>• H1330 Atlantic salt meadows (<i>Glauco-Puccinellietalia maritimae</i>)</li> <li>• H1420 Mediterranean and thermo-Atlantic halophilous scrubs (<i>Sarcocornetea fruticosi</i>)</li> <li>• S1355 Otter, <i>Lutra lutra</i></li> <li>• S1365 Harbour (common) seal, <i>Phoca vitulina</i></li> </ul>	

### Nationally Designated (Statutory)

Surfleet Lows	SSSI	3.8	<p>Surfleet Lows is one of the few remaining wet alluvial meadows in Lincolnshire that has not be subjected to agricultural improvement. Meadows of this type are now rare throughout lowland Britian. The typical range of meadow plants are present along with species more characteristic of coastal locations. Species include: marsh foxtail (<i>Alopecurus geniculatus</i>), floating sweet-grass (<i>Glyceria fluitans</i>), hammer sedge (<i>Carex hirta</i>) and tubular water-dropwort (<i>Oenanthe fistulosa</i>). Areas of marsh are present along with wet fen woodland, pools and tall fen vegetation. Winter flooding attracts birds with at least 50 species recorded. Reed warblers (<i>Acrocephalus scirpaceus</i>) are known to breed here.</p>	2.6 km west
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Site	Status	Area (ha)	Brief description of site	Distance and direction from Refined Siting Zone
The Wash	SSSI	62,046	The whole area is of exceptional biological interest. The intertidal mudflats and saltmarshes represent one of Britain's most important winter-feeding areas for waders and wildfowl outside of the breeding season. Enormous numbers of migrant birds, of international significance, are dependant on the rich supply of invertebrate food. The saltmarsh and shingle communities are of considerable botanical interest and the mature saltmarsh is a valuable bird breeding zone. In addition the Wash is also very important as a breeding ground for common seals.	4.5 km north-east
Vernatts	LNR	1.42	Council and volunteer run nature reserve transformed from wasteland. Area now has a woodland walk with bluebells and is a small haven for wildlife.	2.1 km south-west
<b>County Designated (Non-statutory)</b>				
A16 East Verge North of the River Glen	LWS	N/A	Road verges running along the A16.	1.4 km north-west
A16 East Verge South of the River Glen	LWS	N/A	Road verges running along the A16.	1.4 km west
Blue Gowt Drain, North	LWS	N/A	Drainage channel that comes off from the river Glen LWS. Runs alongside a golf course.	0.5 km west
Blue Gowt Drain, West Marsh Road	LWS	N/A	Section of the Blue Gowt Drain, and both banks, near the northern edge of Spalding.	1 km west
Coronation Channel	LWS	N/A	A diversion around Spalding of the River Welland to reduce flooding in the town. Area is now a LWS with footpaths running along both sides. Birds can be seen within the channel. Coastal and floodplain grazing marsh runs along it.	1.3 km south-west



Site	Status	Area (ha)	Brief description of site	Distance and direction from Refined Siting Zone
River Welland in Spalding	LWS	N/A	River that runs through Spalding and is connected to the Coronation channel. Water flows out towards the Wash.	1.5 km south-west
Surfleet Bank	LWS		A long strip of sandy embankment and adjacent flat pasture on the north-western side of the tidal River Welland, just downstream from the River Glen confluence. One of only two localities in Lincolnshire where the autumn ladies tresses orchid ( <i>Spiranthes spiralis</i> ) has been seen in the last 20 years.	Within the Refined Siting Zone
Moulton River	LWS	N/A	Stretch of canalised drain prone to drying and both banks.	0.6 km north-east
Moulton Park and River	LWS	10.9	Large green space area	1.6 km south-east
Pinchbeck Marsh	LWS	N/A	Large area of arable land between the Vernatt's Drain and the River Welland.	0.3 km west
South Bank Fosdyke	LWS	N/A	A man-made raised floodbank with wide berm along the southern side of the River Welland.	0.8 km north-east
Surfleet Seas End Saltmarsh	LWS	N/A	Area running alongside river Welland that contains coastal and floodplain grazing marsh and mudflats.	<0.1 km west
Vernatt's Drain	LWS	N/A	Drainage channel that runs through arable land close to the River Welland	0.1 km west
Risegate Eau	LWS	N/A	The central 9 km of a 15 km long watercourse.	1.6 km north-west
River Glen Corridor	LWS	N/A	A botanically rich 20 km stretch of the River Glen	0.3 km west

## Habitats

### Habitats of Principal Importance

4.5.19 The following HPI have been identified within the Section 5 Study Area:

- i. Coastal and Floodplain Grazing Marsh;
- ii. Woodland; and
- iii. Hedgerows.

### Ancient Woodland

4.5.20 Based upon available data sources, no ancient woodland is present within the Section 5 Study Area.

### Terrestrial Habitats

- 4.5.21 Where the UKHab surveys have been completed within the Section 5 Survey Area, the habitat area identified was cropland, which is of negligible ecological importance. The surrounding arable field margins, hedgerows and patches of low diversity scrub provide important connectivity through the landscape and are therefore considered to be of Local importance.
- 4.5.22 Some of the hedgerows identified are likely to be HPIs and these would be of County importance.
- 4.5.23 A small woodland was located within the Refined Siting Zone which is assessed to be a HPI and of County importance.
- 4.5.24 Areas of modified grassland were also present throughout the Section 5 Survey Area, some of which are classified as Coastal and Floodplain Grazing Marsh (notably along the River Welland). Coastal and Floodplain Grazing Marsh is recognised as HPI and is assessed as being of up to County importance due to its ecological significance and contribution to biodiversity. Urban areas were found along the route which are of negligible importance.
- 4.5.25 Survey work will continue in 2025, to characterise the terrestrial habitat types which are present within the Section 5 Survey Area, their constituent flora and fauna, and to confirm the condition of relevant habitats. Survey findings will inform the design of appropriate mitigation and the assessment of impacts and effects reported within the ES.

### Aquatic Habitats

- 4.5.26 The River Welland is located within the north of Refined Siting Zone. This watercourse is a Main River and assessed to be of County importance. This Main River flows in a northeasterly direction towards the Wash and is tidally influenced across the reach located within the Study Area. As a result, engagement with the Marine Management Organisation (MMO) has identified that a Marine Licence will be required for the overhead line crossing of the River Welland.
- 4.5.27 A network of smaller ditches/drains are also located within Section 5, which are of Local importance.

- 4.5.28 A total of ten ponds were identified within the Section 5 Survey Area which are of Local importance.
- 4.5.29 Survey work will continue through 2025, to characterise the aquatic habitat types which are present within the Section 6 Survey Area, their constituent flora and fauna, and to confirm the condition of relevant habitats. The survey findings will inform the design of appropriate mitigation and the assessment of impacts.

### **Water Framework Directive (WFD) Waterbodies**

- 4.5.30 Within the Refined Siting Zone, three WFD waterbodies may be crossed by the Project.
- i. River Welland WFD Transitional and Coastal Water Body (Water Body ID: GB530503100400); and
  - ii. Moulton River (Water Body ID: GB205031050755). This is an Internal Drainage Board (IDB) managed watercourse also known as Lord's Drain, classified as a blue line watercourse; and
  - iii. Vernatt's Drain WFD River (Water Body ID: GB205031050705). This is an IDB managed watercourse which discharges into the River Welland via a pumping station.
- 4.5.31 Further details of these WFD waterbodies are provided within **PEI Report Volume 2 Part B Section 5 Chapter 6 Water Environment and Flood Risk**.

### **Protected and Notable Species**

- 4.5.32 Surveys are being undertaken following the methodology included within the **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. The extent of planned surveys is based upon the area within the Refined Siting Zone and a wider zone of influence which is also described within this supporting Appendix. As previously stated, survey work for protected and notable species is currently incomplete and will continue through 2025.

#### **Terrestrial Invertebrates**

- 4.5.33 The habitats within the Section 5 Survey Area largely comprise agricultural land which is of limited value to terrestrial invertebrates. However, floodplain grazing marsh, hedgerow and woodland habitats were also recorded within the Refined Siting Zone and provide potential for a more diverse assemblage of terrestrial invertebrates.
- 4.5.34 Any areas within the Refined Siting Zone that are identified during the 2024/25 habitat surveys as potentially suitable to support species of conservation concern, will be subject to a scoping survey in 2025 to assess their potential importance to invertebrates. Following on from this, targeted surveys would be undertaken if required, to inform the full assessment reported in the ES, and any specific mitigation requirements.

#### **Great Crested Newt (GCN)**

- 4.5.35 There were no desk study records of GCN within the Section 5 Study Area.

- 4.5.36 Great crested newt surveys to date have included various waterbodies across several locations within the Section 5 Survey Area. Surveys have included Habitat Suitability Index (HSI) survey and analysing water samples from ponds for great crested newt eDNA<sup>1</sup>.
- 4.5.37 A total of 10 ponds were identified as being present within the Section 5 Survey Area. Three of these ponds were surveyed in 2024 and the eDNA surveys results for these three ponds were negative for great crested newts.
- 4.5.38 Seasonal survey work will continue in 2025 to confirm the status of great crested newt, and the survey results will be used to inform the full assessment of impacts and effects and the details of appropriate mitigation to be presented in the ES.

### Reptiles

- 4.5.39 Desk study research has indicated that there are no records for reptile species within the Section 5 Study Area.
- 4.5.40 The floodplain grazing marsh, hedgerow and woodland habitats in the Section 5 Study Area have potential for common reptiles, however, the general habitats within the remaining Section 5 Study Area that are suitable for reptiles appear to be limited in extent, being confined to field boundaries and the margins of ditches. Therefore, as any use of the habitats by reptiles is likely to be localised, Section 5 is considered to be of no more than Local importance for reptile species.
- 4.5.41 Survey work will continue in 2025 to inform the full assessment of impacts and effects and the details of appropriate mitigation to be presented within the ES.

### Wintering Birds

- 4.5.42 Surveys for wintering birds were carried out within between November 2022 and March 2023. Surveys involved monthly vantage point (VP) surveys (November 2022 to March 2023), split walked/driven transects (December 2022 to March 2023), and driven transects (once in January 2023 and once in March 2023). There was one VP in Section 5 (VP 4). Data relevant to the Section 5 Refined Siting Zone were recorded, including a 500 m buffer to account for the mobility of birds and the limited coverage of survey extents.
- 4.5.43 Within the ornithological surveys of Section 5, the species found to be present in winter, are presented in **PEI Report Volume 3 Part B Section 5 Appendix 4A Bird Survey Data 2022-24, Table 4A.1**. Noting the limited survey extent, a range of target species were recorded with limited diversity, including gulls and (predominantly) waders. All records were in flight apart from Canada goose (*Branta canadensis*), where 48 birds were observed. A maximum count of 80 lapwing was noted. Three Amber-listed species were recorded, and one Red-listed species was observed (lapwing (*Vanellus vanellus*)) (Ref 12). Over winter, no species recorded are considered to be of County importance or greater. As Table 4A.3 summarises, the majority of wintering species recorded are considered to be of Local importance or of lower value.

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<sup>1</sup> eDNA refers to tiny traces of genetic material shed by organisms in their environment. For great crested newts, this could be skin cells left in the water. By collecting water samples and analysing them for newt DNA, their presence or absence from a particular waterbody may be determined.

4.5.44 Further avian survey work has been undertaken across the winter of 2024/2025 and will be analysed (along with all of the avian survey data) to inform the full assessment of impacts and effects and the details of appropriate mitigation to be presented in the ES.

#### Breeding Birds

4.5.45 Surveys for breeding birds were carried out between March 2024 and July 2024. A single transect partly covered the Section 5 Survey Area.

4.5.46 For breeding bird data, the numbers of territories is derived from a standardised approach of assessing breeding status given proximity of observations (including acoustic records) and the distribution of suitable habitat.

4.5.47 Data presented represent only those species of conservation concern as defined by Red or Amber listed species (Ref 12) species of principal importance under Section 41 of the NERC Act (Ref 13), and Schedule 1 species of the Wildlife and Countryside Act 1981.

4.5.48 Breeding season data, showing the species and the numbers of territories recorded are presented in **PEI Report Volume 3 Part B Section 5 Appendix 4A Bird Survey Data 2022-24, Table 4A.2**. A range of bird species were recorded on site, typical of an arable landscape. Species included farmland specialists, such as skylark (*Alauda arvensis*), yellow wagtail (*Motacilla flava*), and corn bunting (*Emberiza calandra*). Seven Red-listed species and two Amber-listed species were recorded in Section 5. However, the transect only had partial coverage of the Section 5 Survey Area and thus the number of territories does not represent the total number of birds breeding or those using this area in the breeding season.

4.5.49 All of the recorded species are considered to be of Local importance based upon a combination of survey records, local distribution and Birds of Conservation Concern (BoCC) status (see **PEI Report Volume 3 Part B Section 5 Appendix 4A Bird Survey Data 2022-24, Table 4A.3**).

4.5.50 Upon assessment of the Year 1 breeding bird survey results, further survey work will be required in 2025. Therefore, the results presented in **PEI Report Volume 3 Part B Section 5 Appendix 4A Bird Survey Data 2022-24** are incomplete. Once available, the full survey results will be assessed and presented within the ES.

4.5.51 It is important to note that this section considers the importance of a species in the context of the geographical extent of Section 5 only. An initial route-wide assessment is included in **PEI Report Volume 2 Part C Route-wide Assessment Chapter 3 Ecology and Biodiversity**.

#### Badger

4.5.52 Desk study survey records included 16 records of badger within the Section 5 Study Area. These included recorded setts and signs of badger activity and badger casualties on roads (mainly along the A16 to the west) ..

4.5.53 Surveys for badger were conducted between November 2024 and March 2025 and incidental records of badger field signs were recorded during other species and habitat surveys.

- 4.5.54 Two potential main badger setts and multiple feeding signs were recorded within the Section 5 Survey Area. The results of the badger surveys (including the locations of the setts) will be presented in a Confidential Appendix to the ES.
- 4.5.55 Given its common status and widespread distribution within the county, Badger is assessed as being of Local importance.
- 4.5.56 Surveys are ongoing in 2025 to inform the design of appropriate mitigation and the assessment of likely significant effects within the ES.

#### Bats

- 4.5.57 Local Records Centre data for the Section 5 Study Area included records of roosting brown long-eared bat (*Plecotus auritus*), soprano pipistrelle (*Pipistrellus pygmaeus*) and Daubenton's bat (*Myotis daubentoni*). Of these bat roost records, five fall within the Refined Siting Zone, one for Daubenton's bat and four for brown long-eared bats.
- 4.5.58 There were no European Protected Species Mitigation Licences (EPSML) for bats within the Section 5 Study Area.  
  
Initial surveys for bats were carried out between May and October 2024.
- 4.5.59 The field activity surveys completed to date have confirmed that the bat species present within the Section 5 Survey Area include common pipistrelle (*pipistrellus pipistrellus*), soprano pipistrelle, *Myotis* sp., Leisler's bat (*Nyctalus leisleri*), Nathusius pipistrelle (*Pipistrellus nathusii*), Daubenton's bat, brown long-eared, barbastelle (*Barbastella barbastellus*) and noctule (*Nyctalus noctula*). The activity surveys indicated that hedgerows and woodland edges are being utilised by foraging and commuting bats within the Survey Area.
- 4.5.60 Survey work was also conducted in winter 2024/2025 and will continue in spring/summer 2025 to confirm assemblage of foraging and commuting bats, bat roosts and the status of bats. When planned surveys are complete, results will inform the design of appropriate mitigation and the assessment of impacts that will be presented within the ES. It is noted that at the time of writing this PEI Report, results from the winter 2024/2025 surveys were not available.
- 4.5.61 At this stage no buildings or structures are known to be within the Refined Siting Zone. If any buildings or structures are identified within the Refined Siting Zone and potential impacts to bats are identified, these will be surveyed accordingly.

#### Otter

- 4.5.62 Desk study records included two records of otter within the Section 5 Study Area. These included signs of otter activity but no details were given.
- 4.5.63 Initial surveys for otter were carried out between March 2024 and October 2024.
- 4.5.64 Within the Section 5 Survey Area, no field signs of otter were identified, and no breeding or resting sites were recorded.
- 4.5.65 Where suitable otter habitat exists, surveys will be completed to confirm presence/absence.
- 4.5.66 Given its recovering status and importance within the county, where otter is present, the species is assessed as being of County importance.

4.5.67 Survey work will continue in 2025 to inform the full assessment of impacts and effects and the details of appropriate mitigation measures to be presented in the ES.

#### Fish

4.5.68 Desks study research has identified Environment Agency (EA) records of one notable fish species within Section 5 Study Area, which was European eel (*Anguilla anguilla*).

Table 4.4 Notable fish species identified within the Section 5 Study Area

Common Name	Scientific name	Designation/Status	Importance
European eel	<i>Anguilla anguilla</i>	Global Red List Post 2001 – Critically Endangered, Annex II of the Habitats Directive, Appendix II of the Bonn Convention, UK Biodiversity Action Plan (BAP) 2007, Section 41 NERC Act 2006, Eels (England and Wales) Regulations 2009, Salmon and Freshwater Fishes Act (SAFFA) 1975, OSPAR, European Union and Trade in Wild Fauna and Flora-AB	County, due to the relative scarcity of this species and small population size likely to be affected.

4.5.69 Survey work will be conducted in 2025 to confirm the status of fish within the Study Area and to inform the design of appropriate mitigation and the assessment of impacts which will be presented, with the full survey results, in the ES.

#### Aquatic Macroinvertebrates

4.5.70 No notable aquatic macroinvertebrate species have been recorded within the Section 5 Study Area based upon the completed desk study.

4.5.71 Supplementary survey work will be conducted in 2025 to confirm the status of aquatic macroinvertebrates within the Section 5 Survey Area, and to inform the full assessment of impacts and effects and the details of appropriate mitigation measures to be presented within the ES, along with the completed survey results.

#### Aquatic Macrophytes

4.5.72 No notable aquatic macrophyte species have been identified within the Section 5 Study Area based upon the completed desk study..

4.5.73 Survey work will be undertaken in 2025 to confirm the status of aquatic macrophytes within the Section 5 Survey Area and to inform the full assessment of impacts and effects and the details of appropriate mitigation measures to be presented within the ES, along with the completed survey results.

## Water Vole

- 4.5.74 Desk study records included over than 100 records of water vole within the Section 5 Study Area. These included sightings of individuals and signs of water vole activity including droppings and burrows throughout the area.
- 4.5.75 Initial surveys for water vole were carried out between March 2024 and October 2024.
- 4.5.76 Within the Section 5 Survey Area, three water vole latrines were identified within one watercourse within the Refined Siting Zone, a ditch located in the centre of the Survey Area approximately 1 km south-west of Western Barn House. However, the majority of ditches were found to be unsuitable for water vole due to being dry at the time of survey.
- 4.5.77 Where suitable water vole habitat exists, surveys will be completed to confirm presence/absence. Given its declining status and importance within the county, where water vole is present, the species is assessed as being of County importance.
- 4.5.78 Survey work is continuing in 2025 to confirm the status of water vole to inform the full assessment of impacts and effects and the details of appropriate mitigation measures to be presented within the ES, along with the completed survey results.

## Other Protected and Notable Species

- 4.5.79 The desk study returned records for brown hare (*Lepus europaeus*), hedgehog (*Erinaceus europaeus*), polecat (*Mustela putorius*) and common toad (*Bufo bufo*) within the Section 5 Study Area.
- 4.5.80 Habitats within the Section 5 Survey Area are suitable for these species, which are SPI and of Local importance. During the field surveys, incidental evidence of brown hare was also noted within a field in the north of the Section 5 Survey Area.
- 4.5.81 Survey work will continue in 2025 to inform the design of any appropriate mitigation and the assessment of impacts and effects presented within the ES.

## Invasive Non-native Species

- 4.5.82 Desk study research has revealed the presence of two invasive non-native species: giant Hogweed (*Heracleum mantegazzianum*); and Chinese mitten crab (*Eriocheir sinensis*). These species are listed under both Schedule 2 of the Invasive Alien (Enforcement and Permitting) Order 2019 and Schedule 9 of the Wildlife Countryside Act 1981.
- 4.5.83 No specific INNS survey has been undertaken; however field observations have been made during other ecological surveys undertaken within the Survey Area. Based upon the surveys completed to date, incidental evidence of American mink (*Mustela vison*) was noted along a ditch in the north of the Section 5 Survey Area. This species is listed on Schedule 9 of the Wildlife and Countryside Act.
- 4.5.84 Further planned habitat and species surveys, such as those for aquatic habitats and invertebrates, will include the recording of invasive non-native species. The results of these further surveys will be presented in the ES.



## Future Baseline

- 4.5.85 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.
- 4.5.86 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.
- 4.5.87 Habitats within the Refined Siting Zone and Study Area comprise mainly arable farmland currently under cultivation .
- 4.5.88 In addition to the main habitat coverage, field boundaries are in places defined by hedgerows, ditches and farm tracks, with the River Welland located in the north of the Refined Siting Zone.
- 4.5.89 Existing ecological features are unlikely to materially change in the future. Those areas of known change will be assessed, where necessary, as part of the surveys in 2025.
- 4.5.90 Relative to the current baseline, the value of priority ecological features present within or close to the Refined Siting Zone are not expected to change significantly by the end of the construction period. Management of the habitats is unlikely to change over this period, and consequently no significant degradation or improvement of habitat condition is expected.
- 4.5.91 Due to development pressure year on year within the wider landscape, protected and notable species and habitats are likely to remain priorities for conservation within future baseline scenarios.

## 4.6 Design, Control and Additional Mitigation Measures

- 4.6.1 As set out in **PEI Report Volume 2 Part A Chapter 4 Approach to PEI Preliminary Environmental Information**, mitigation measures fall into one of three categories: embedded design measures; control and management measures; and additional mitigation measures. Those measures relevant to the assessment of effects on important ecological features are set out below.

### Design Mitigation Measures

- 4.6.2 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 14) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 15) 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 16) 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.

- 4.6.3 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.
- 4.6.4 Further detail on the embedded design mitigation measures applicable to Section 5 will be provided within the ES. In Section 5 such measures are anticipated to include refinement of the draft Order Limits to avoid designated sites, HPs and important receptors as far as practicable. This is in accordance with the Planning Inspectorate's Advice on Habitats Regulations Assessment relevant to nationally significant infrastructure projects, (September 2024) (Ref 17), the Habitats Regulations 2017 (Ref 18).
- 4.6.5 At sensitive crossing locations (e.g. rivers), existing access routes would be used as far as practicable and the width of any required working area minimised. If access upgrades are required, large or sensitive watercourses, for example those designated as a Main River, and those with WFD status, will be crossed using clear span bridges. Where culverts are implemented, these will either be arch culverts, leaving the natural bed undisturbed, or as far as reasonably practicable, they would be installed with the invert set below the natural bed level for a semi-natural bed to establish within the culvert.
- 4.6.6 Wherever practicable, areas of temporary habitat loss will be reinstated back to the type of baseline habitat affected or improved/enhanced. The ES will also include proposals for enhancing existing habitats. Areas of permanent habitat loss will be considered during the siting and design of measures required to achieve a net gain in biodiversity value.

## Control Mitigation Measures

### Construction

- 4.6.7 A Preliminary CoCP is provided in **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. General control measures included within the Preliminary CoCP relevant to the Ecology and Biodiversity assessment include:
- i. GG01: The proposed Project will be compliant with all relevant legislation, consents and permits. (*i.e. The Conservation of Habitats and Species Regulations 2017 and The Wildlife and Countryside Act 1981. See PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy for more detail on relevant legislation, consents and permits*).
  - ii. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerk of Works (EnvCoW) 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.

- iii. 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.
- iv. GG05: A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.
- v. 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 Plan (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'.
- vi. 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
- vii. GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition (including Agricultural Land Classification ((ALC)) grade) and use. Hedgerows, fences, and walls (including associated earthworks and

boundary features) will be reinstated to a similar style and quality to those that were removed, in consultation with the landowner.

- viii. GG09: Where sensitive features such as ancient woodland and protected habitats are to be retained within or immediately adjacent to the Order Limits, an appropriate protective area will be established using appropriate fencing and signage and will be inspected, repaired, and replaced as necessary. The protective areas will be shown on the Retention and Reinstatement Plans contained within the LEMP.
- ix. 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.
- x. GG15: Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be identified. All refuelling, oiling and greasing of construction plant and equipment will take place above drip trays and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities. Potentially hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a capacity of 110 per cent of the maximum stored volume. Spill kits will be located nearby.
- xi. GG16: Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).
- xii. GG17: Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps, daily checks and ongoing monitoring.
- xiii. GG19: Earthworks and stockpiled soil will be managed as per the SMP.

4.6.8 The topic specific control and management measures included within the Preliminary CoCP which are relevant to the assessment of effects upon Ecology and Biodiversity receptors are:

- i. B01: The contractor(s) will comply with relevant protected species legislation. Appropriate licences will be obtained where necessary from Natural England for all works affecting protected species as identified by the ES and through pre-construction surveys. All applicable works will be undertaken in accordance with the relevant requirements and conditions set out in those licences.
- ii. B02: In the event that vegetation or any other feature with the potential to support breeding birds is required to be removed during the main breeding bird season (01 March to 31 August) or, in the case of Schedule 1 birds (e.g. barn owl), is likely to be disturbed, then works will be undertaken in the presence or

- supervised by an Ecological Clerk of Works (ECoWs). Appropriate protection measures will be put in place should active nests be found. These will include exclusion zones around active nests until chicks fledge or nests become inactive as determined by monitoring by the ECoWs. Active nests of wild birds are protected at all times and therefore the same measures will be put in place if an active nest is identified at any time of year.
- iii. B03: Where there will be a risk of animal entrapment, a means of escape will be installed into all excavations left open overnight.
  - iv. B04: To control the spread of invasive weeds in accordance with the Wildlife and Countryside Act 1981, any plant or machinery that has been used in areas contaminated or infested with invasive species (both terrestrial and aquatic), such as Japanese knotweed and Himalayan balsam, will be thoroughly cleaned. Water used to clean vehicles will be discharged or emptied into the contaminated area controlled to prevent the spread of the plant (through plant propagules, e.g. seeds, rhizomes, fragments, etc.). The area will be cordoned off to prevent any inadvertent spreading. Any plant material or soil contaminated with plant propagules if removed from a site is classified as controlled waste and should be disposed of in a suitably licensed landfill site, accompanied by appropriate Waste Transfer documentation, and must comply with Section 34 of the Environmental Protection Act 1990. Further detail will be set out in a Biosecurity Management Plan.
  - v. B05: Subject to the location and scale of impact, suitable habitat for common reptiles will be subject to two-stage habitat manipulation that will take place between mid-March and mid-October. Firstly, vegetation will be cut to approximately 150 mm (with the arisings removed) under the supervision of an ECoW and the site left for a minimum of two days to allow reptiles to naturally disperse from the area. Secondly, vegetation will be cleared down to ground level under the supervision of an ECoW. Vegetation will be cleared using appropriate equipment based on the type of vegetation to be removed, the area affected, and the risk of mortality or injuring reptiles. Construction works could commence immediately after completion of the second stage. Reptile hibernacula will be retained and protected during construction where practicable. If unavoidable, the removal of vegetation and groundworks at hibernacula will be timed to avoid the hibernation season (late October to early March). Replacement hibernacula and refugia will be provided prior to clearance of any suitable habitat.
  - vi. B06: Alternative roost structures (bat boxes) will be installed, prior to felling of trees with bat roost potential (with landowner consent), on retained trees within the Order Limits or areas outside of the Order Limits agreed with landowners. Unless specified otherwise by the provisions of any protected species licence for bats, two boxes will be provided for each tree to be felled where Potential Roost Features (PRF) on that tree are classified as PRF-I bat roost potential. Five boxes will be provided for each tree with PRF-M bat roost potential to be felled.
  - vii. B07: Alternative barn owl breeding sites (barn owl boxes) will be installed, prior to removal of nesting sites, (with landowner consent) on retained trees or poles within the Order Limits or areas outside of the Order Limits agreed with landowners.
  - viii. B08: Where the works require the crossing or removal of hedgerows, the gap will be reduced to a width required for safe working. Where hedge removals are

necessary, 'dead hedging' should be used, where practicable, in the interim periods to retain connectivity during construction. Dead hedging can comprise vegetation arisings or artificial provision, such as willow screening panels or Heras fencing covered in camouflage netting. New hedgerow planting will contain native, woody species of local provenance.

- ix. B09: Habitat translocation or any species translocation (if required) that is not covered by protected species licences will be undertaken in accordance with a strict method statement. The method statement will be specific to the habitat type or species affected and will detail the appropriate construction methods, timing, management, receptor site preparation and post-construction habitat management and monitoring. The receptor site will be clearly identified and prepared in advance of translocation.
- x. B10: 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.
- xi. B11: Where works require dewatering of waterbodies known to contain fish, fish removal and relocation will be required (which will require appropriate permits such as an FR2 licence from the EA).
- xii. B12: A method statement to ensure works within watercourse crossings include suitable measures to allow the passage of otters, water vole and fish throughout construction (i.e., during fluctuating water levels).
- xiii. B13: In the first instance reasonable avoidance measures will be incorporated to avoid impacting known otter holts/couches, badger setts and/or trees identified as having bat roosting potential and suitable buffer zones implemented.
- xiv. 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 LEMP. 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.
- xv. LV02: The contractor(s) will apply the relevant protective principles set out in British Standard (BS) 5837:2012: Trees in relation to design, demolition, and construction. This will be applied to trees within the Order Limits which will be preserved through the construction phase, and to trees outside of the Order Limits where such measures do not hinder or prevent the use of the relevant working width for construction. An Arboricultural Clerk of Works (ACoW) will ensure the suitability of tree protection before and during the construction phase. All works to high grade trees, including trees under Tree Preservation Orders and veteran trees, will be undertaken, or supervised by a suitably qualified arboriculturist.
- xvi. 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.
- xvii. LV04: Construction lighting will be of the lowest luminosity necessary to safely perform tasks. Lighting will be directional and minimised where possible.

- xviii. W01: All works affecting watercourses or within the relevant permitting stand-off distance from the top of bank or landward toe of a flood defence on main rivers and IDB-maintained watercourses will be in accordance with a method approved under consents issued under the Environmental Permitting Regulations 2016, Land Drainage Act 1991, IDB Byelaws (where relevant) or the protective provisions of the DCO for the benefit of the Environment Agency, LLFAs and IDBs . Where possible, a stand-off distance from the top of bank of all watercourses/waterbodies will be established (with the exception of crossings and where existing field access roads are already located adjacent to watercourses are to be utilised). To align with Environment Agency and IDB consenting requirements, it is proposed that this will be: 16 m for tidal main rivers; 8 m for non-tidal main rivers; and 9m for IDB-maintained watercourses. No statutory stand-off distances are specified for ordinary watercourses, but any works liable to cause an obstruction to flow would be subject to consent under the Land Drainage Act 1991. Appropriate stand-off distances should also be implemented where Project construction activities coincide with water supply and sewerage infrastructure. These are to be agreed on a case-by-case basis. For any instances where the stand-off distances stated above cannot be achieved between construction works and watercourses, these works would be subject to the appropriate consent by the relevant drainage authority (FRAP for main rivers, OWC for ordinary watercourses).
- xix. W02: For open cut watercourse crossings and installation of vehicle crossing points, good practice measures will include but not be limited to, where practicable:
- reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working;
  - installation of a pollution boom downstream of open cut works;
  - the use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required;
  - have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident;
  - the use of all static plant such as pumps in appropriately sized spill trays;
  - prevent refuelling of any plant or vehicle within 15 m of a watercourse;
  - prevent storing of soil stockpiles within 15 m of a main river;
  - inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids; and
  - reinstating the riparian vegetation and natural bed of the watercourse, using the material removed when appropriate, on completion of the works and compacting as necessary. If additional material is required, appropriately sized material of similar composition will be used.
- xx. W03: Riverbank and in-channel vegetation will be retained where not directly affected by installation works. Natural substrate will be provided through temporary watercourse crossings culverts.
- xxi. W04: Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary spanned bridges.

Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and construction mats placed over the backfilled area to permit the passage of plant, equipment, materials, and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge. Specific detailed designs for each watercourse crossing, consistent with these design principles, will be prepared by the construction contractor. These will be subject to the appropriate consent by the relevant drainage authority (Flood Risk Activities Permit from the EA for main rivers, Ordinary Watercourse Consent from the Lead Local Flood Authority or Internal Drainage Board for ordinary watercourses).

- xxii. W05: The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard not only to volumes and discharge rates, but also to water quality (particularly suspended solids, pH and hydrocarbons) and will include discharges to land, water bodies or third-party drains/sewers.
- xxiii. W10: Severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes, and these drainage systems would be permanently reinstated to ensure their existing function is maintained.
- xxiv. W11: Appropriate control of runoff from working areas will be achieved through implementation of a DrMP for the construction phase. The DrMP will use sustainable urban drainage systems (SuDS) principles, promoting infiltration of runoff wherever possible and specifying appropriate treatment and attenuation storage to ensure any discharges to watercourses are uncontaminated and limited to greenfield rates. The DrMP will cover all aspects of construction works and temporary infrastructure. Drainage measures will be phased to be completed before the commencement of earthwork operations, in a specific area, and will be retained until the drainage system of the completed Project is fully operational, or site restoration works are completed. This will include the temporary diversion of existing agricultural drainage around working areas, if required, followed by reinstatement on completion of works. At this stage of the design process, preliminary work has already been done to identify runoff treatment and attenuation requirements for temporary access tracks and working areas associated with overhead line construction, including defining potential locations of water treatment areas and discharge outfalls. Further work is required to develop drainage strategies for substations, considering arrangements for both construction and operational phases of the Project, which will be reported as part of the ES chapter and FWRA in submission with the DCO application.

4.6.9 The CEMP will include other standard measures relating to ecology such as pre-construction surveys to validate and, where necessary, update the baseline survey findings. The purpose of these pre-construction surveys would be to ensure mitigation during the construction phase is based on the latest protected species information. This would also be required for any protected species licensing.



## Operation and Maintenance

- 4.6.10 During the operation and maintenance of the Project, National Grid operatives would 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).
- 4.6.11 Key measures relevant to the control of potential impacts upon ecology and biodiversity during operation and maintenance 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;
  - 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;
  - iii. Identifying and notifying the presence of invasive species within the operational areas of the site;
  - iv. Proactively seeking to avoid disturbance to birds during the breeding season, including the use of deterrent measures, acting as early as possible;
  - v. Reviewing the need for licenses, ensuring existing licenses adequately cover the operations and activities planned on sites and ensuring the correct use of and compliance with licenses; and
  - vi. Ensuring that tenancy and land use agreements include requirements to protect, preserve and enhance habitats, biodiversity and ecosystem services.
- 4.6.12 During the operation and maintenance of the Project, 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.
- 4.6.13 Additionally, habitats created or enhanced by the Project and embedded within the design, will be managed in accordance with the LEMP.

## Additional Mitigation

- 4.6.14 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.
- 4.6.15 Potential additional mitigation measures which may be required to reduce the effects of the Project upon Ecology and Biodiversity are in the early stages of development, based upon an iterative process informed by ongoing survey and assessment
- 4.6.16 Any mitigation and compensation measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders, including engagement with the statutory consultees.
- 4.6.17 Finalised additional mitigation or compensation measures will be detailed within the ES.

## 4.7 Preliminary Assessment of Effects

- 4.7.1 The following section presents the findings of the preliminary assessment of effects upon the ecological receptors identified within the Section 5 Study Area, as a result of construction, maintenance and/or operational activities.
- 4.7.2 As discussed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**, only features of local importance and above, where there is the potential for the project to impact them directly or indirectly, have been taken forward to impact assessment. In addition, consideration is given to INNS where in the absence of mitigation there is potential for a legal offence.
- 4.7.3 The conclusions of the preliminary assessment are based upon surveys completed to date and professional judgement of the ecological receptors likely to be present within the Study Area and influenced by the construction, maintenance and/or operation of the Project. The precautionary principle has been applied, such that where information about a particular receptor is incomplete or uncertain, then significant effects have not been excluded. Therefore, at this stage, most of the ecological receptors identified in the baseline of this PEI Report have been retained in the assessment. The significance of effects reported may be greater than that reported at the ES stage, once all survey data has been collated, the status of these receptors confirmed and all mitigation measures identified. An updated assessment will be included within the ES submitted with the DCO application.
- 4.7.4 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described. This assessment does not take into account the Additional Mitigation Measures at this stage as these are subject to further design refinement and will be informed by stakeholder engagement and the baseline survey findings.
- 4.7.5 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 4.5**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 4.7.6 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

##### Designated Sites

- 4.7.7 The nearest internationally designated sites are The Wash SPA and Ramsar site, which are located 4.5 km north-east of the Refined Siting Zone. The Wash and North Norfolk Coast SAC is also located 4.5 km east of the Refined Siting Zone at their closest point.

- 4.7.8 In addition, the internationally designated Nene Washes SPA and Ramsar site, where bird species with large foraging ranges are noted as, or one of, the qualifying features, are located 24.2 km south of the Refined Siting Zone at its closest point.
- 4.7.9 According to Natural England guidance (Ref 19), only those main component species of internationally designated sites which have an overlapping IRZ with the Refined Siting Zone, are considered to be functionally linked. 'Functionally linked land' (FLL) 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. Given the distances of the Refined Siting Zone from the identified sites, no direct habitat loss within the designated areas is considered likely. However, impacts through habitat loss, degradation and displacement may occur within FLL, as a result of construction of the Project.
- 4.7.10 The Wash SPA and Ramsar site include birds as qualifying features. The IRZ for the SPA and Ramsar site overlaps with the Refined Siting Zone, in relation to primarily wintering Bewick's swan, whooper swan, and pink-footed goose. Further assessment is required once bird surveys are completed and data assessed, to consider potential impacts upon the qualifying species and the waterbird assemblage of these Internationally designated sites.. 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), and significant effects cannot be excluded at this stage of the assessment.
- 4.7.11 The Wash and North Norfolk Coast SAC is designated for its habitats such as seedbanks, mudflats and coastal lagoons and also includes otters as qualifying features. Potential pathways of effect include 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 potential for LSE upon this site will be assessed within the Report to inform HRA, and significant effects cannot be excluded at this stage in the assessment.
- 4.7.12 Species of the Nene Washes SPA and Ramsar site includes birds as qualifying features. The IRZ for the SPA and Ramsar site overlaps with the Refined Siting Zone, in relation to primarily wintering pink-footed goose. Further assessment is required once bird surveys are completed and data assessed, to consider potential impacts upon the qualifying species and the waterbird assemblage of these Internationally designated sites. The potential for LSE upon these sites will be assessed within the Report to Inform the HRA (to be submitted with the ES), and significant effects cannot be excluded at this stage in the assessment.
- 4.7.13 The Impact Risk Zones (IRZ's) for the nationally designated Surfleet Lows SSSI (designated for its wet alluvial meadow habitats) and The Wash SSSI (designated for its intertidal mudflats and saltmarshes, which represent one of Britain's most important winter-feeding areas for waders and wildfowl outside of the breeding season) partially overlap with the Refined Siting Zone.
- 4.7.14 The Wash SSSI is located 4.5 km north-east of the Project. There are potential hydrological links between the project and this SSSI, however, given the separation distances and the pollution prevention measures secured by the CoCP, no effects upon habitats are predicted. The bird assemblage of the SSSI may use habitats within the wider area for foraging and there is potential for some of the land within the Refined Siting Zone 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. Therefore, on a precautionary basis, significant effects cannot be excluded at this stage of the assessment.

- 4.7.15 Taking into account the pollution prevention measures within the Preliminary CoCP (such as GG15, GG16, GG17), impacts upon the remaining nationally designated sites within 5 km of the Refined Siting Zone (or where the IRZ overlaps) significant impacts are not anticipated and are included within **Table 4.5**.
- 4.7.16 There are 15 LWSs that are located within 2 km of the Refined Siting Zone, which includes Surfleet Bank LWS which is partially within the Refined Siting Zone and Surfleet Seas End Saltmarsh LWS and Vernatts Drain LWS which are located within 0.1 km of the Refined Siting Zone. Due to the proximity of the Refined Siting Zone to these LWS there is a risk of adverse 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. It is however noted that indirect impacts associated with the release or mobilisation of pollutants are not likely to result in significant effects upon these sites, given the embedded control measures set out within the Preliminary CoCP.
- 4.7.17 Further survey work will establish the nature and importance of any receptors associated with these LWS that may be affected by the works. Therefore, on a precautionary basis, significant effects cannot be excluded at this stage of the assessment.
- 4.7.18 Due to the distance from the Refined Siting Zone and embedded control measures set out within the Preliminary CoCP, no significant effects are anticipated for the remaining 12 LWS's located within 2 km of the Refined Siting Zone and these are included in **Table 4.5** below.

## Habitats

### Terrestrial Habitats

- 4.7.19 Initial habitat survey results indicate that the majority of Section 5 is cultivated cropland with negligible biodiversity importance. Areas of this habitat will be lost during construction of the substation(s); pylons and stringing areas; and to create haul roads and temporary works areas (e.g. compounds) for construction.
- 4.7.20 Pylons will be located outside of HPI where possible, however some areas of HPI are likely to be directly affected by the proposed ground works within the Refined Siting Zone through habitat loss, which could include the Coastal and Floodplain Grazing Marsh along the River Welland; and small areas of broadleaved woodland across the Section 5 Survey Area.
- 4.7.21 Grazing marsh is defined as periodically inundated pasture or meadow, typically with ditches or rills containing standing brackish or fresh water. The 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. Further assessment of potential indirect impacts due to construction activities, including changes in air quality, will be undertaken and reported within the ES.
- 4.7.22 Hedgerows, scrub and small woodland parcels could be crossed by the proposed overhead line, depending on the final alignment. Temporary severance of hedgerows

may occur during construction, where the haul road route and access routes are proposed. Wherever possible, habitats will be reinstated post construction. Existing tracks and roads will be utilised where possible however these may require widening.

- 4.7.23 Survey work will continue through to 2025 to characterise the terrestrial habitat types, and their constituent flora and fauna, within and adjacent to the Refined Siting Zone. Survey findings will also confirm the condition of relevant habitats and inform the design of appropriate mitigation and the assessment of impacts and enhancement, which will be developed fully in the ES.
- 4.7.24 In the absence of supplementary survey findings and confirmed additional mitigation measures, significant effects on terrestrial habitats within the Refined Siting Zone cannot be excluded at this stage of the assessment.

#### Aquatic Habitats

- 4.7.25 There are a number of watercourses, ditches and ponds located within or close to the Refined Siting Zone, including the River Welland in the north of the Study Area.
- 4.7.26 Potential direct impacts upon aquatic habitats within the Section 5 Study Area would include those associated with overhead line watercourse crossings. However, these would be minimised through the setting back of pylons from the channel and marginal habitats. The stringing of the overhead lines could potentially result in temporary loss or damage to watercourses and ditches at crossing points (total number to be confirmed when design finalised) within the Refined Siting Zone, however the stringing methodology will seek to minimise any potential impacts to watercourses during construction and any impacts are likely to be temporary.
- 4.7.27 Within Section 5, there will be a number of watercourse crossings (total number to be confirmed during the development of the ES when the design is finalised) which 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. However, with the best practice construction methods and reinstatement of these habitats post-construction, these effects are likely to be temporary.
- 4.7.28 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 SuDS features have the potential to adversely affect the river system, both directly and indirectly, if not designed appropriately. However, the design of drainage features within Section 5 will include SuDS basins to allow settlement before discharge into any river system. Further assessment of potential indirect impacts due to construction activities, including changes in water quality, will be undertaken and reported within the ES.
- 4.7.29 As noted above, survey work will continue through to 2025 to characterise the terrestrial and aquatic habitat types, and their constituent flora and fauna, within and adjacent to the Refined Siting Zone. Survey findings will also confirm the condition of relevant habitats and inform the design of appropriate mitigation or compensation measures and the assessment of impacts and enhancement, which will be developed fully in the ES.
- 4.7.30 In the absence of supplementary survey findings and confirmed additional mitigation measures, significant effects on aquatic habitats within the Refined Siting Zone cannot be excluded at this stage of the assessment.

## Protected and Notable Species

### Terrestrial Invertebrates

- 4.7.31 Survey results to date indicate that the majority habitats (i.e. cropland) within the Section 5 Survey Area have limited value to terrestrial invertebrates. However, floodplain grazing marsh, hedgerow and woodland habitats also recorded within the Survey Area may have suitability to support a more diverse invertebrate assemblage.
- 4.7.32 Potential impacts upon terrestrial invertebrates therefore include habitat loss, habitat fragmentation and death/injury through the loss of floodplain grazing marsh and woodland habitats and severance of hedgerows.
- 4.7.33 Relevant measures within the Preliminary CoCP which would reduce potential impacts include implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09) and maintenance of hedgerow connectivity (B08).
- 4.7.34 A scoping survey will be undertaken in 2025 to assess the habitats recorded in 2024/25 to assess the potential importance of habitats to invertebrates. Following on from this, targeted surveys would be undertaken if required, to inform the assessment of impacts and effects and design of appropriate mitigation, which will be reported within the ES.
- 4.7.35 On a precautionary basis, significant effects on terrestrial invertebrates cannot be excluded at this stage of the assessment.

### Great Crested Newt

- 4.7.36 Ten ponds were located within the Survey Area for Section 5, of which three have been surveyed for great crested newt. The survey results to date indicate that great crested newt is absent from these ponds.
- 4.7.37 The design is yet to be finalised, and ponds and waterbodies will be avoided where practicable. However, potentially suitable aquatic and terrestrial habitat for great crested newts including ponds, hedgerows and grassland up to 500 m away from ponds may be directly impacted through habitat loss/severance during construction, due to the establishment of construction compounds and access routes and within the footprint of pylons. Additionally, there is a risk of machinery and traffic killing or injuring great crested newts if they are present within the Refined Siting Zone during construction activities.
- 4.7.38 Where impacts upon great crested newt cannot be avoided, a licence from Natural England would be required to permit derogation (as outlined in management measure B01). Indicative locations for mitigation are illustrated on **PEI Report Volume 2 Part B Section 2 Figure 1.3 Permanent and Operation Features**.
- 4.7.39 Additional relevant management measures within the Preliminary CoCP which would reduce potential impacts include pollution control measures (GG15, GG16, GG17 and W1 to W11), 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).
- 4.7.40 Survey work will continue in 2025 to inform the assessment of impacts and effects and the design of appropriate mitigation to be presented in the ES. Further survey findings will also be used to confirm any licencing and enhancement requirements.

4.7.41 On a precautionary basis, significant effects on great crested newt cannot be excluded at this stage of the assessment.

#### Reptiles

4.7.42 The majority of habitats within the Refined Siting Zone that are suitable for reptiles are limited in extent, being confined to field boundaries and the margins of ditches. However, floodplain grazing marsh, hedgerow and woodland habitats also recorded within the Survey Area have potential for common reptiles

4.7.43 There are potential impacts through habitat loss and risk of killing and/or injury of reptiles during construction.

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

4.7.45 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include implementation of Management Plans (GG06), reinstatement of hedgerows (GG08), establishment of protective areas (GG09), maintenance of hedgerow connectivity (B08).

4.7.46 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 effects and the details of appropriate mitigation and enhancement to be presented within the ES.

4.7.47 On a precautionary basis, significant effects on reptiles cannot be excluded at this stage of the assessment.

#### Birds: Breeding and Wintering

4.7.48 Surveys for wintering birds carried out between November 2022 and March 2023, indicate that a range of species were found to be present in winter within the Section 5 Survey Area (noting limited survey extent) (see **PEI Report Volume 3 Part B Section 5 Appendix 4A Bird Survey Data 2022-24, Table 4A.3**).

4.7.49 Surveys for breeding birds, carried out between March 2024 and July 2024, indicated low use is made by breeding birds within the Section 5 Survey Area (noting limitations of the survey extent) (see **PEI Report Volume 3 Part B Section 5 Appendix 4A Bird Survey Data 2023, Table 4A.2 and Table 4A.3**).

4.7.50 Although measure B02 in the Preliminary CoCP would ensure the impacts of the construction upon active nests would be mitigated, the construction works within Section 5 are likely to result in a loss of breeding and wintering habitat and disturbance to birds through noise, construction traffic movements and increased human presence on-site.

4.7.51 Additional relevant measures within the Preliminary CoCP which would 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).

4.7.52 It should be noted that bird surveys are incomplete, and survey work has continued over the winter of 2024/2025 and will also be undertaken in spring/summer of 2025 to confirm the status of wintering and breeding birds respectively, and to inform the

assessment of impacts and the design of appropriate mitigation and enhancement, which will be further developed and presented within the ES.

- 4.7.53 On a precautionary basis, significant effects on wintering and breeding birds e.g. through habitat loss and disturbance, cannot be excluded at this stage of the assessment.

#### Badger

- 4.7.54 Two potential main badger setts were recorded within the Section 5 Survey Area and there is therefore potential for direct impacts through the loss of these setts. Specifically, hedgerow and areas of woodland habitats will potentially require clearance during construction during the establishment of on-site accesses and within the footprint of proposed pylons. Habitat loss for badger could be temporary or permanent (where substation(s) are proposed).
- 4.7.55 There is also potential for general disturbance impacts during construction from noise and vibration, temporary site lighting, human presence and potentially an increased risk of vehicle-animal collisions. In addition, there are legal restrictions regarding certain construction works (e.g. piling) which could take place close to active setts. Specifically, hedgerow and areas of woodland habitats will require clearance during construction during the establishment of on-site accesses and within the footprint of proposed pylons.
- 4.7.56 As outlined in Preliminary CoCP measure B13, in the first instance, reasonable avoidance measures will be incorporated to avoid impacting known badger setts. If, however direct impacts on badger setts cannot be avoided, a licence from Natural England will be sought to permit derogation (as outlined in Preliminary CoCP measure B01). Mitigation measures may include the provision of artificial setts within the Order Limits where main setts will be closed. Additional relevant management measures within the Preliminary CoCP which would 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 (LV04) and closing of excavations overnight to avoid entrapment (B03).
- 4.7.57 Survey work continued during winter 2024/2025 and spring 2025 to confirm the status of badger 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.
- 4.7.58 On a precautionary basis, significant effects on badger cannot be excluded at this stage of the assessment.

#### Bats

- 4.7.59 Surveys in 2024 confirmed that bats were foraging and commuting within the Section 5 Survey Area and indicated that bats were associated with hedgerows and woodland edges along the overhead line route.
- 4.7.60 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 may require clearance during



construction during the establishment of haul roads and within the footprint of proposed pylons and substation(s).

- 4.7.61 As outlined in Preliminary CoCP measure B13, in the first instance, reasonable avoidance measures will be incorporated to avoid impacting known bat roosts. Where impacts upon bat roosts cannot be avoided, a licence from Natural England will be required to permit derogation (as outlined in Preliminary CoCP measure B01).
- 4.7.62 Additional relevant management measures within the Preliminary CoCP which would 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).
- 4.7.63 The survey work in 2024 and 2025 will be used to confirm presence of foraging and commuting bats and bat roosts, particularly the presence of any bat roosts within or close to the Refined Siting Zone. The outputs of these surveys will be used to confirm the status of bats and the assessment reported within the ES.
- 4.7.64 On a precautionary basis, significant effects on bats cannot be excluded at this stage of the assessment.

#### Otter

- 4.7.65 Initial surveys for otter carried out in 2024 did not find any field signs of otter within the Section 5 Survey Area and no breeding or resting sites were recorded.
- 4.7.66 Where suitable habitat for otter is present, there is the potential for disturbance through noise, vibration, lighting and increased human presence on site. Habitat degradation could potentially occur through pollution of habitats and there is also a risk of machinery and traffic killing or injuring otters if they are present during construction activities.
- 4.7.67 As outlined by Preliminary CoCP measure B13, in the first instance, works would be located to avoid the loss of any otter holts or resting places. If it is not possible to avoid impacts on otter holts, a licence from Natural England would be sought to permit derogation from legislation (as outlined in Preliminary CoCP measure B01).
- 4.7.68 Additional relevant measures within the Preliminary CoCP which would 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) and closing of excavations overnight to avoid entrapment (B03). Preliminary CoCP measure B12 requires a method statement to be in place to ensure works within watercourse crossings include suitable measures to allow the passage of otters.
- 4.7.69 Survey work will continue in 2025 to confirm the status of otter and will be used to inform the assessment of impacts and effects, and details of any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.
- 4.7.70 On a precautionary basis, significant effects on otter cannot be excluded at this stage of the assessment.

#### Fish

- 4.7.71 Notable fish species have been recorded within the Section 5 Study Area.

- 4.7.72 There is a risk that habitats supporting protected and notable fish species will potentially be impacted during construction and maintenance by transmission line infrastructure, supporting structures and associated haul road and maintenance routes. Short-term impact on habitat connectivity, fragmentation, degradation and disturbance cannot be discounted at this stage, as well as the risk of incidental mortality of protected fish species during construction works.
- 4.7.73 As outlined in Preliminary 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). Where impacts upon notable fish species cannot be avoided, appropriate permits may be required, such as an FR2 licence from the Environment Agency (B11).
- 4.7.74 Additional relevant management measures set out in the Preliminary 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). 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.
- 4.7.75 Survey work in 2025 will be used to confirm the status of species present and inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.
- 4.7.76 A precautionary approach has therefore been taken and significant effects on fish cannot be excluded at this stage of the assessment.

#### Aquatic Macroinvertebrates

- 4.7.77 No notable aquatic macroinvertebrate species have recorded within the Section 5 Study Area.
- 4.7.78 There is a risk that habitats suitable for protected and notable aquatic macroinvertebrate species are impacted by proposed construction works e.g. habitat loss, fragmentation and disturbance and a risk of incidental mortality of aquatic macroinvertebrates.
- 4.7.79 Relevant management measures set out in the Preliminary CoCP to reduce potential impacts 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).
- 4.7.80 Survey work will be carried out in 2025 to confirm the status of this taxon and inform assessment of construction related effects and design of appropriate mitigation plans if required. Survey site selection has been based on crossing point locations where culverts, bridges and/or outfalls have the potential to influence macroinvertebrate populations. Surveys will inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.
- 4.7.81 A precautionary approach has been taken and significant effects on aquatic macroinvertebrates cannot be excluded at this stage of the assessment.

#### Aquatic Macrophytes

- 4.7.82 There are no records of notable and/or protected aquatic macrophyte species within the Section 5 Study Area.
- 4.7.83 There is a risk of construction works impacting watercourses and associated aquatic macrophytes 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).
- 4.7.84 Relevant management measures set out in the Preliminary CoCP to reduce potential impacts include pollution control measures (GG15, GG16, GG17 and W1 to W11), implementation of Management Plans (GG06) and establishment of protective areas (GG09).
- 4.7.85 Survey work will be carried out in 2025 to confirm the status of aquatic macrophytes and inform the assessment of impacts and any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.
- 4.7.86 On a precautionary basis, significant effects on aquatic macrophytes cannot be excluded at this stage of the assessment.

#### Water Vole

- 4.7.87 Initial surveys indicate that water vole are present within at least one watercourse within the Section 5 Study Area.
- 4.7.88 Where suitable water vole habitat exists, there is a risk of construction works impacting watercourses and associated riparian habitat causing incidental mortality of protected species. Furthermore, there may be suitable habitats within and/or adjacent to the Refined Siting Zone that could be impacted by proposed works (e.g. through habitat loss, disturbance and fragmentation).
- 4.7.89 If impacts to water vole burrows cannot be avoided, a licence from Natural England will be sought to permit derogation (as outlined in Preliminary CoCP measure B01).
- 4.7.90 Additional relevant measures within the Preliminary CoCP which would reduce potential impacts include pollution control measures (GG15, GG16, GG17), implementation of Management Plans (GG06), establishment of protective areas (GG09) and lighting restrictions (LV04). Preliminary CoCP measure B12 requires a method statement to be in place to ensure works within watercourse crossings include suitable measures to allow the passage of water vole.
- 4.7.91 Survey work will continue in 2025 to confirm the status of water vole and will be used to inform the assessment of impacts and effects, and details of any appropriate mitigation and enhancement, which will be developed fully and presented within the ES.
- 4.7.92 On a precautionary basis, significant effects on water vole cannot be excluded at this stage of the assessment.

## Operation and Maintenance

### Designated Sites

- 4.7.93 The Wash SPA, Ramsar site and SSSI and Nene Washes SPA and Ramsar site are designated for their bird interest. There is potential for collision mortality to occur during the operational phase of the Project. This will be assessed once baseline surveys are complete and the results presented within the ES and the Report to Inform HRA.
- 4.7.94 Therefore, on a precautionary basis, significant effects upon these designated sites, associated with collision risk and subsequent killing/injury of bird species which are qualifying features, cannot be excluded at this stage.
- 4.7.95 European designated sites within the Section 5 Study Area can be sensitive to changes in flow regimes, including the volume of water supplied, water depth and water flow rates. In SACs, the potential impact of altered flow regimes can directly affect the qualifying habitats and hydrological changes may impact SAC/SPA species indirectly. The potential for likely significant effects (LSE) upon these sites will be assessed within the Report to Inform HRA, and significant effects cannot be excluded at this stage in the assessment.

### Protected and Notable Species

#### Birds: Breeding and Wintering

- 4.7.96 As noted above in relation to designated sites, the collision risk with the overhead lines within the Section 5 Study Area will need to be fully assessed once further winter and breeding bird data have been collected.
- 4.7.97 Therefore, on a precautionary basis, significant effects upon breeding and wintering birds associated with collision risk cannot be excluded at this stage of the assessment.

### Likely Non-Significant Effects

- 4.7.98 For completeness, **Table 4.5** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Ecology and Biodiversity effects.

Table 4.5 Preliminary summary of non-significant Ecology and Biodiversity effects - Section 5

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
<b>Construction</b>					
Surfleet Lows SSSI and Vernatts LNR	Habitat loss	National	Permanent or Temporary	Due to the distance of these sites from the Refined Siting Zone there will be no habitat loss within these nationally designated sites.	Not significant
	Habitat degradation as a result of contamination during construction, changes in air quality, dust, changes in water quality	National	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management (such as Preliminary CoCP pollution prevention measures GG15, GG16, GG17).	Not significant
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 LWS, Coronation Channel LWS, West Marsh Road LWS, Risegate Eau LWS, River Welland in Spalding LWS, Moulton Park and River LWS, Moulton River LWS, Pinchbeck Marsh LWS, South Bank Fosdyke LWS, River Glen Corridor LWS	No Impact	County	Temporary or Permanent	No mitigation required due to the distances from the Refined Siting Zone, and also the lack of ecological or hydrological connectivity, there is not considered to be a pathway to effects. Therefore no mitigation required.	Not significant

<b>Receptor</b>	<b>Impact</b>	<b>Receptor Importance</b>	<b>Duration</b>	<b>Embedded Mitigation / Rationale</b>	<b>Likely Significance of Effect</b>
Hedgehog, brown hare, common toad, polecat	Habitat loss, incidental harm or mortality	Local	Permanent or Temporary	The following control measures detailed within the Preliminary CoCP would prevent harm to hedgehog and brown hare during construction: GG06, B01, B03. Habitats impacted temporarily during construction would be reinstated post construction (GG08).	Not significant
Invasive Non-Native Species (INNS)	Spread of INNS during maintenance activities	N/A	Permanent	Preliminary CoCP measure B04 would ensure that the construction works do not result on the spreading or mishandling of any invasive non-native species.	Not significant
<b>Operation / Maintenance</b>					
Surfleet Lows SSSI and Vernatts LNR	No Impact	National	Permanent or Temporary	No mitigation required due to the distances from the Refined Siting Zone, and also the lack of ecological or hydrological pathways to effect.	Not significant
Surfleet Bank LWS, Surfleet Seas End Saltmarsh LWS, Vernatts Drain LWS	Contamination during maintenance works	County	Temporary	During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of vegetation	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				within and adjacent to assets (e.g. substations, pylons, access routes).	
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 LWS, Coronation Channel LWS, West Marsh Road LWS, Risegate Eau LWS, River Welland in Spalding LWS, Moulton Park and River LWS, Moulton River LWS, Pinchbeck Marsh LWS, South Bank Fosdyke LWS, River Glen Corridor LWS	No impact	County	Permanent or Temporary	No mitigation required	Not significant
Coastal and Floodplain Grazing Marsh HPI, Woodland HPI, River Welland	Contamination during maintenance works	County	Temporary	During the operation and maintenance of the Project, National Grid operatives would 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).	Not significant
Arable field margins, hedgerows, patches of low diversity scrub, ditches/drains, ponds	Contamination during maintenance works	Local	Temporary	During the operation and maintenance of the Project, National Grid operatives would	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				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).	
Terrestrial invertebrates	Habitat loss or fragmentation	TBC following surveys (if necessary)	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not significant
	Contamination of habitats during maintenance works	TBC following surveys (if necessary)	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would 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	Not significant



Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				to assets (e.g. substations, pylons, access routes).	
Great crested newt	Habitat loss, killing or injury	County	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not significant
	Contamination of habitats during maintenance works	County	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would 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).	Not significant
Reptiles	Killing or injury during maintenance	Local	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				refurbishment works to ensure that ecological constraints present at the time would be identified and potential impacts mitigated accordingly.	
Wintering birds	Disturbance (e.g. noise, vibration) during maintenance activities	TBC following baseline surveys – species recorded to date - Local	Temporary	The nature of maintenance works (involving inspections and maintenance of overhead line infrastructure) are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not significant
Breeding birds	Loss of nests	TBC following baseline surveys – species recorded to date - Local	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and mitigated accordingly.	Not significant
	Disturbance (e.g. noise, vibration) during maintenance activities	TBC following baseline surveys – species recorded to date - Local	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
Badger	Loss/damage of setts, killing or injury	County	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and potential impacts mitigated accordingly.	Not significant
	Disturbance (e.g. noise, vibration) during maintenance works	County	Temporary	The nature of maintenance works (involving inspections and maintenance of overhead line infrastructure) are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not significant
Bats	Habitat loss (including loss of roosts if tree felling is required)	TBC following baseline surveys	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and potential impacts mitigated accordingly.	Not significant
	Disturbance of roosts (e.g. noise,	TBC following baseline surveys	Temporary	The nature of maintenance works are anticipated to be small in scale and of an	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
	vibration) during maintenance works			intermittent nature and therefore broadly comparable to current agricultural operations or less.	
Otter	Loss/damage of holts, killing or injury	County	Permanent	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and potential impacts mitigated accordingly.	Not significant
	Disturbance (e.g. noise, vibration) during maintenance works	County	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not significant
	Contamination of habitats during maintenance works	County	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				<p>routine maintenance activities, such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes).</p> <p>National Grid would consult 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.</p>	
Fish	Disturbance (e.g. noise, vibration) during maintenance works	TBC following baseline surveys	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not significant
	Contamination of habitats during maintenance works	County	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities,	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				<p>such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes). National Grid would consult 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.</p>	
Aquatic macroinvertebrates	Disturbance (e.g. noise, vibration) during maintenance works	TBC following baseline surveys	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not significant
	Contamination of habitats during maintenance works	TBC following baseline surveys	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities, such as the management of	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				<p>vegetation within and adjacent to assets (e.g. substations, pylons, access routes). National Grid would consult 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.</p>	
Aquatic macrophytes	Contamination of habitats during maintenance works	TBC following baseline surveys	Temporary	<p>The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would 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). National Grid would consult with the relevant regulatory body where works are required in, around, or that may impact watercourses, or there is a</p>	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				potential impact on local flora and fauna of works near controlled waters.	
Water vole	Habitat Loss, killing or injury	County	Permanent or temporary	National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be identified and potential impacts mitigated accordingly.	Not significant
	Disturbance (e.g. noise, vibration) during maintenance works	County	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not significant
	Contamination of habitats during maintenance works	County	Temporary	The likelihood of contamination is considered to be minimal assuming appropriate management. During the operation and maintenance of the Project, National Grid operatives would be required to adhere with National Grid best practice requirements during the completion of routine maintenance activities,	Not significant



Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				<p>such as the management of vegetation within and adjacent to assets (e.g. substations, pylons, access routes). National Grid would consult 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.</p>	
Brown hare, hedgehog common toad, polecat	Disturbance (e.g. noise, vibration) during maintenance works	Local	Temporary	The nature of maintenance works are anticipated to be small in scale and of an intermittent nature and therefore broadly comparable to current agricultural operations or less.	Not significant
Invasive Non-Native Species (INNS)	Spread of INNS during maintenance activities	N/A	Permanent	National Grid would identify and notify the presence of invasive species within the operational areas of the site. National Grid or their appointed Contractor would be required to appoint an ecologist during any maintenance or refurbishment works to ensure that ecological constraints present at the time would be	Not significant

Receptor	Impact	Receptor Importance	Duration	Embedded Mitigation / Rationale	Likely Significance of Effect
				identified and mitigated accordingly.	

## 4.8 Monitoring

- 4.8.1 Monitoring requirements, that may be required for the Project following the implementation of mitigation to ensure mitigation is successful and meets the requirements or permits/licences, will be described in detail and presented in the ES once the on-going surveys are complete (and a detailed data set obtained), and mitigation and enhancement measures have been developed.

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# 5. Historic Environment

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# 5. Historic Environment

## 5.1 Introduction

- 5.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Historic Environment assessment for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 5.1.2 The assessment for Section 5 is based on a Refined Siting Zone boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 5.1.3 Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 5.1);
  - ii. Identification of key local and regional policy relevant to the assessment (section 5.2). 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 subsequent scope of the Historic Environment assessment (section 5.3). 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 Historic Environment assessment within Section 5 (section 5.4). 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 Section 5 Study Area relevant to the Historic Environment assessment (section 5.5);
  - vi. A description of mitigation measures included for the purposes of the Historic Environment assessment reported within the PEI Report (section 5.6). 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 Historic Environment effects arising during construction and operation of the Project within Section 5 (section 5.7), based upon the assessment completed to date; and



viii. An outline of the proposed monitoring requirements in relation to Historic Environment (section 5.8).

5.1.4 Further supporting information is set out in **Table 5.1** below, including supporting figures and technical appendices.

Table 5.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 5.1 Designated Heritage Assets; Figure 5.2 Non-designated Heritage Assets</b>
<b>PEI Report Volume 3 Part B Section 5 Appendix 5A Known Heritage Assets</b>	A list of all identified heritage assets within the assessment Study Area. This will be updated and amended as required to inform the Environmental Statement (ES).
<b>Project Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.

Supporting Information	Description
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 5.1.5 There are also interrelationships between the potential effects on the Historic Environment 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 5 Chapter 2 Landscape** to assist in the identification and assessment of the impact of the Project within the historic landscape and potential impacts to individual historic landscape features and assets such as Registered Parks and Gardens;
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 3 Visual** to inform the understanding of the extent to which the Project is visible in the landscape which may result in visual changes to the settings of heritage assets and their values;
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 10 Noise and Vibration** to inform the understanding of the extent to which noise and vibration impacts arising from the Project may extend, which could result in changes to the settings of heritage assets and their values;
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
  - v. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.

## 5.2 Legislation and Policy Framework

- 5.2.1 Legislation and national policy relevant to the Project and this chapter are described in **PEI Report Volume 2 Part A Chapter 2 Legislative, Regulatory and Planning Policy** and supporting appendices, detail of which is set out in **Table 5.1**.

## Regional and Local Policy

- 5.2.2 Regional and local plans or policies relevant to this assessment are as follows.
- i. The South East Lincolnshire Local Plan 2011-2036 Adopted 8th March 2019 (Ref 1):
    - Policy 29: The Historic Environment - distinctive elements of the South East Lincolnshire historic environment will be conserved and, where appropriate, enhanced.

## 5.3 Scope of Assessment

- 5.3.1 The scope of the assessment 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 EIA Scoping Report (Ref 3). 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 Landscape 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**.
- 5.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 5.3.3 The scope of the construction assessment covers the following heritage assets:
- i. Designated heritage assets (scheduled monuments, listed buildings, conservation areas and registered parks and gardens, noting that no World Heritage Sites or registered battlefields are located within the Section 5 Study Area); and
  - ii. Non-designated heritage assets (e.g. buried archaeological remains, earthwork remains, non-designated historic buildings and structures, non-designated historic parks and gardens, tracks/routeways and artefact scatters).
- 5.3.4 The scope of the operation assessment covers the following heritage assets:
- i. Designated heritage assets (scheduled monuments, listed buildings, conservation areas and registered parks and gardens, noting that no World Heritage Sites or registered battlefields are located within the Section 5 Study Area); and
  - ii. Non-designated heritage assets (e.g. earthwork remains, non-designated historic buildings and structures, non-designated historic parks and gardens and tracks/routeways).

## 5.4 Assessment Methodology

- 5.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Landscape 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 is outlined below.

- 5.4.2 The preliminary assessment carried out for the Historic Environment in Section 5 has identified designated and non-designated heritage assets using baseline data. Those heritage assets considered to have the potential to be impacted by the Project have been selected for inclusion in the preliminary assessment. The preliminary assessment follows three key stages:
- i. The assessment of an asset's value (heritage significance) taking into account the asset's designated status, heritage interest (e.g. archaeological, architectural, artistic and historic) as defined by paragraph 5.9.3 of EN-1 (Ref 11) with reference to the National Planning Policy Framework (NPPF) Annex 2 Glossary (Ref 12), consultation, regional variation and individual qualities;
  - ii. A high-level assessment of potential impacts arising from the construction of the new substation(s) and connecting overhead line and operation of the Project. Impacts can affect the physical fabric of a heritage asset or affect its setting and can be temporary or permanent; and
  - iii. An assessment of whether the effects arising from the Project on each heritage asset are likely to be significant or not significant.
- 5.4.3 It has not been possible to assess the magnitude of the potential impacts or categorise the resulting significance of effects at the current time. A full impact assessment will be presented in the Historic Environment chapter of the ES.

## Assessment Assumptions and Limitations

- 5.4.4 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 5.4.5 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**.
- 5.4.6 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

## 5.5 Baseline Conditions

### Study Area

- 5.5.1 The preliminary assessment for the Historic Environment assessment of Section 5 utilises the following Study Areas, comprising the area directly affected by the Project and a buffer around the draft Order Limits, as detailed further in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**:
- i. 1 km from Section 5 for non-designated heritage assets;

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

5.5.2 In addition, designated heritage assets of high value located beyond the 5 km Study Area will be assessed where their setting has the potential to be impacted by the Project. The selection of designated heritage assets beyond the 5 km Study Area has been undertaken using professional judgement and in consideration of heritage assets highlighted by stakeholders.

## Data Collection

5.5.3 The following data has been used to inform the baseline conditions:

- i. The National Heritage List for England (NHLE), held by Historic England, for designated assets;
- ii. Lincolnshire, Cambridgeshire and Norfolk Historic Environment Records (HER) for non-designated heritage assets;
- iii. Historic landscape characterisation (HLC) mapping undertaken by local planning authorities;
- iv. Geological mapping held by the British Geological Survey (BGS); and
- v. Various online sources including:
  - Historic Ordnance Survey maps held by the National Library of Scotland;
  - Historic England's Aerial Archaeology Mapping Explorer; and
  - local authority conservation area appraisal and management documents and their mapping.

## Existing Baseline

5.5.4 The following section outlines the Historic Environment baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:

- i. **Volume 2 Part B Section 5 Figure 5.1 Designated Heritage Assets;**
- ii. **Volume 2 Part B Section 5 Figure 5.2 Non-designated Heritage Assets;** and
- iii. **Volume 3 Appendix 5A Known Heritage Assets.**

5.5.5 Designated heritage assets are referenced with their National Heritage List for England (NHLE) reference number (e.g. NHLE 1010947).

5.5.6 Non-designated assets are referenced using the relevant HER unique identifier number (e.g. MLI240 for Lincolnshire)).

5.5.7 Non-designated heritage assets identified by the preliminary assessment that are not yet recorded on the county HERs (e.g. possible archaeological remains identified by geophysical survey), have been assigned a unique identifier using an AEC prefix (e.g. AEC500).

## Geology and Topography

- 5.5.8 Section 5 is located in National Character Area 46 - The Fens, which extends across southern Lincolnshire, Cambridgeshire and Norfolk. The Fens are characterised by low-lying, flat and expansive landscape, with wide views to the horizon (Ref 13).
- 5.5.9 Human interaction across the Fenlands has led to some changes to the topography; historically, the Fenlands would seasonally flood. Since the 17th century, however, systematic drainage of the area has occurred and subsequently, the peat has dried significantly and caused widespread subsidence. Due to the shrinkage of the peat deposits, roddons (alluvial palaeochannel deposits) are now much more prominent within the landscape forming a focus of past settlement activity.
- 5.5.10 Superficial deposits comprise clay and silt Tidal Flat deposits formed between 11.8 thousand years ago and the present are recorded across the entirety of Section 5 (Ref 14).
- 5.5.11 Tidal Flat Deposits are recorded by the BGS across the Fenlands as a mixture of tidal flat muds, peat and intertidal sands. The intertidal muds are characterised as blueish grey to greyish brown sandy clay which are associated with a low energy shallow marine and saltmarsh environment. The intertidal sands are generally comprised of quartz with uncommon feldspar and are associated with sandflats, tidal channel, estuarine and subtidal settings.
- 5.5.12 The bedrock geology underlying Section 5 is recorded as Jurassic mudstone of the Oxford Clay Formation, formed between 166.1 and 157.3 million years ago (Ref 14).

## Designated Heritage Assets

- 5.5.13 There are no World Heritage Sites, Registered Parks and Gardens or Registered Battlefields within the 3 km or 3-5 km Section 5 Study Areas.
- 5.5.14 Located within the 3 km Section 5 Study Area, there are 33 designated heritage assets, summarised in **Table 5.2**, with none located within the Refined Siting Zone. Three scheduled monuments are located within the 3 km Section 5 Study Area and comprise a moated monastic grange, a drainage pump and a church yard cross. Of the 29 listed buildings in this Study Area, one grade I and seven grade II listed buildings are located within Pinchbeck Conservation Area. Other settlements with concentrations of listed buildings include Surfleet, Moulton Seas End and Weston. The remaining listed buildings are scattered throughout the rural landscape, generally comprising isolated farmsteads.

Table 5.2 Designated heritage assets within the 3 km Section 5 Study Area

Designation	Number of assets within Study Area	Number of assets within the Refined Siting Zone
Scheduled monument	3	0
Conservation area	1	0
Grade I listed building	4	0
Grade II* listed building	0	0
Grade II listed building	25	0

- 5.5.15 No designated heritage assets of high value have been identified within the 3-5 km Section 5 Study Area.
- 5.5.16 No designated heritage assets of high value located beyond the 5 km Section 5 Study Area have been identified by the preliminary assessment as potentially being impacted by the Project. Potential impacts to designated heritage assets of high value located beyond the 5 km Section 5 Study Area will be considered further in the assessment presented in the ES.

### Non-designated Heritage Assets

- 5.5.17 A total of 66 non-designated heritage assets have been identified within the 1 km Section 5 Study Area, of which 17 assets are located within, or overlap with, the Refined Siting Zone. A total of 19 non-designated buildings have been identified which remain extant within the 1 km Section 5 Study Area. A further four buildings are recorded by the Lincolnshire HER within the Refined Siting Zone which are no longer extant, having been demolished. A summary of the types of non-designated heritage assets identified is provided in and discussed, where appropriate, in the archaeological and historical background below.

Table 5.3 Non-designated heritage assets within the 1 km Section 5 Study Area

Asset Type	Number of assets within 1 km Section 5 Study Area	Number of assets within the Refined Siting Zone
Cropmarks	2	2
Earthworks (including roddons and sea defences)	1	2
Saltern Site	6	0
Settlement/Occupation features	14	0
Deserted medieval village	0	0
Moated Site	1	0
Ridge and Furrow	0	0
Parkland	0	0
Farmstead or buildings extant	13	6
Farmstead or buildings demolished	6	4
Military Remains	1	0
Roads/trackways/railways/canals	1	1
Woodland/Covert	0	0
Former Watercourses	0	1
Ecclesiastical	0	0

<b>Asset Type</b>	<b>Number of assets within 1 km Section 5 Study Area</b>	<b>Number of assets within the Refined Siting Zone</b>
Industrial	0	0
Find spot	4	1

5.5.18 It should be noted that find spots are locations where artefacts have generally been removed from their primary archaeological context and often represent residual material found in archaeological deposits of a chronologically later date. As such, their presence can be indicative of an area's past uses and can contribute to an understanding of the area's archaeological potential. They are not heritage assets as defined by the NPPF and, as the archaeological finds have been removed from their location, they would not be impacted by the Project, resulting in no effect to their value.

### **Archaeological and Historic background**

5.5.19 Prehistoric activity in the Fens is likely to be largely masked by thick deposits of alluvial and peat deposits. Whilst much of the northern areas of the fenlands were dominated by marshlands, areas of southern Lincolnshire underwent a period of marine transgressions and regressions which led to the deposition of thick silt deposits in this area of the Fens, known as the Upper Barroway Drove Beds (3000-2000 BP). This area of the Fens is known as the 'Silt Fens'.

5.5.20 An example of deeply deposited early prehistoric remains has been recorded at Cowbit, located approximately 7 km south west of the Refined Siting Zone. Archaeological investigations at Cowbit identified Mesolithic working platforms buried approximately 10 m below ground level, indicating that early prehistoric remains likely survive across the Silt Fens but are largely hidden by thick silt deposits. Evidence of Late Neolithic finds close to Pinchbeck, approximately 4 km west of the Refined Siting Zone have also been recorded. These have been suggested to have been disturbed finds from a much deeper Neolithic flint working platform.

5.5.21 Much of the Bronze Age landscape within the Study Area have either been sealed by the alluvial deposits or destroyed by ancient watercourse scouring and removing Bronze Age remains and truncating deeper surviving deposits dating to the Mesolithic and Neolithic periods.

5.5.22 The Roman settlement of the Silt Fens began in the first century AD, with many small farmsteads and small settlements linked by a series of droveways, which allowed quicker and easier access across the marshlands. Many of these settlements were established on much higher raised areas of silt, known as roddons.

5.5.23 Between the 3<sup>rd</sup> and 4<sup>th</sup> centuries, marine inundations occurred across the landscape close to Pinchbeck and Surfleet, leading to a number of Late Roman settlements being deeply buried under alluvial deposits. Evidence of abandoned Roman settlements on the edge of the Silt Fens has been located and recorded close to Pinchbeck, approximately 3km west of the Refined Siting Zone.

5.5.24 Due to the deep accumulation of alluvial and peat deposits and the further marine inundations between the 3<sup>rd</sup> and 4<sup>th</sup> centuries, no heritage assets dating to the



prehistoric and Roman period have been recorded within Refined Siting Zone or the 1 km Section 5 Study Area.

- 5.5.25 Middle Saxon settlement sites have been recorded close to both Pinchbeck and at Gosberton. These settlements were built upon low mounds which are not naturally formed, rather they have been built up on accumulated settlement waste or 'dark earth'. Archaeological excavations at Gosberton indicated three phases of occupation, with settlement features such as sunken-floored buildings, rectangular structures, pits, and ditches.
- 5.5.26 A single early medieval heritage site, the settlement of Weston (MLI20331), has been identified to the south east within the 1 km Section 5 Study Area, with early medieval activity (MLI92284, MLI92282 and MLI92283, MLI99285) located just east and north of the current village indicating substantial early medieval settlement activity.
- 5.5.27 Due to the high salt content of the Fenland marshes, salt extraction began in the prehistoric period and continued throughout the Roman, early medieval and medieval periods. Saltern sites have been identified through the discovery of dense concentrations of briquetage often associated with dark soil marks that surround the salterns. Their location is often close to a roddon and they survive as low earthwork mounds.
- 5.5.28 A group of six medieval saltern sites (MLI89833-MLI89837, and MLI23633) have been recorded close to Pinchbeck, within the 1 km Section 5 Study Area on the western side of the River Welland approximately 700 m from the Refined Siting Zone.
- 5.5.29 Throughout the medieval period, water management of the fens was undertaken within the tidal areas and earthwork banks were constructed to protect low lying grazing and arable land. A sea bank earthwork extending west from the settlement of Moulton (MLI98446) to the River Welland cross the centre of the Refined Siting Zone.
- 5.5.30 Much of the medieval economy was reliant on major monastic and religious centres, with two of the large and regionally important monasteries located at Ely and Peterborough, with a third important religious centre located at Lincoln. The monasteries held large tracts of land, which were farmed by a monastic communities known as Granges, distinct from the secular manorial system. The Wykeham Chapel scheduled monument (NHLE 1019096) located immediately south west of the Refined Siting Zone, is a rare example of a moated monastic grange, retreat house and chapel of the Benedictine order. The monument comprises well surviving standing buildings, earthwork and buried archaeological remains. The standing remains of the chapel of St Nicholas are a designated as a grade I listed building (NHLE 1064471). The adjoining graveyard lies at the centre of the moated grange and is part of the scheduling. The extant late 17th century Chapel Farmhouse is also a grade II listed building (NHLE 1147513).
- 5.5.31 Many of the moated manorial sites on the Silt Fens belonged to the Priory of Spalding, with several of the moated manor sites recorded close to the settlement of Pinchbeck, approximately 3.5 km west of the Refined Siting Zone. A single moated Site (MLI20329) has been identified approximately 80 m east of the Refined Siting Zone.
- 5.5.32 The site of Wimberely Hall (MLI20330) has also been recorded within the 1 km Section 5 Study Area, approximately 185 m south east of the Refined Siting Zone. The hall was constructed in the late 16<sup>th</sup> century and was occupied by the Wimberley family. The hall was demolished in 1962, with a modern farm now located on the site of the hall.

- 5.5.33 Large portions of the Fenlands were reclaimed in the 17<sup>th</sup> century, under the Fenlands drainage scheme which was established shortly after the accession of James I in 1603, the work continuing over the next 300 years. The drainage scheme comprised large-scale dewatering and drainage through the excavation of new drainage ditches, sluices, the importing of new soil material and water management through new earthwork banks.
- 5.5.34 Following the reclamation and drainage of the Fenlands, the smaller field systems were amalgamated, with some of the larger fields sub-divided following the Parliamentary Enclosure Acts of the late 18<sup>th</sup> and 19<sup>th</sup> centuries. Evidence of this agricultural activity has been recorded at Weston, with a ditch containing post-medieval pottery recorded within the 1 km Section 5 Study Area (MLI86089). Further agricultural ditches were recorded close to Spalding (MLI116278) and at Surfleet (MLI125699) within the 1 km Section 5 Study Area.
- 5.5.35 Following the land reclamation of the Fenlands and the alteration of the agricultural landscape, farmsteads were established during the 18<sup>th</sup> and 19<sup>th</sup> centuries to serve the newly divided and enlarged fields. A number of surviving grade II listed post-medieval farmhouses are recorded within the 3 km Section 5 Study Area, including Seasend Hall (NHLE 1064468), The Farmhouse (At RH Scrimshaw and Sons) (NHLE 1064503), Wraggmarsh House Farmhouse (NHLE 1147603), The Farmhouse (170m south west of Landell House) (NHLE 1359272) and Chapel Farmhouse (NHLE 1147513).
- 5.5.36 A grade II listed Methodist Chapel (NHLE 1147449) dating to 1835 has also been identified within the village of Moulton Seas End, located approximately 1.5 km to the east of the Refined Siting Zone.
- 5.5.37 Three artefact scatters containing post-medieval pottery were recorded at Spalding, with one scatter located in the 1 km Section 5 Study Area (MLI85275), and a further two located within the Refined Siting Zone (MLI85278 and MLI85279).
- 5.5.38 The industrial development of Weston took place throughout the 19<sup>th</sup> century, with the village becoming larger and more urbanised. Part of this urbanisation included the establishment of a tramway (MLI22401) through Weston. The tramway extended through the northern part of the Refined Siting Zone between Wragg Marsh Farm and Western Barn House.
- 5.5.39 Two grade II listed First World War memorials have been identified within the 3 km Section 5 Study Area, namely, Moulton Seas End War Memorial (NHLE 1454594) located within the settlement of Moulton Seas End and Surfleet War Memorial (NHLE 1482125) located within the settlement of Surfleet.
- 5.5.40 Aerial photography has identified a number of undated cropmarks across the 1 km Section 5 Study Area, including ditches and ring gullies (MLI83167), a pit (MLI116279) close to Spalding, ditches (MLI85111), close to Pinchbeck, ditches at Surfleet (MLI125700) and a trackway (MLI85256), ditches (MLI86088 and MLI116098), pits (MLI116216 and MLI124932) and a watercourse (MLI86087) close to Weston.
- 5.5.41 Three undated ditches at Wykeham Farm (MLI87291 and MLI87292 and MLI89824), have been recorded within the Refined Siting Zone.

## Historic Landscape Character

- 5.5.42 Section 5 is located within a single Lincolnshire regional character area (WSH10: The Wash) defined by the Lincolnshire Historic Landscape Characterisation project (Ref 16). Within each of the RCAs are a number of subsidiary historic landscape character zones (HLCZ).
- 5.5.43 The Wash: Reclaimed Coastal Fringe (WSH4) HLCZ is located across the northern area of Section 5. The west edge of the Reclaimed Coastal Fringe landscape is formed by the canalised river channel of the Welland. Whilst settlement is predominantly dispersed there are some nucleated settlements such as Holbeach Hurn and Moulton Seas End located mainly towards the south of the Zone close to the medieval sea bank (Ref 17).
- 5.5.44 The Wash: Townlands (WSH6) HLCZ extends across the southern area of Section 5. The landscape within the character zone comprised of a mixture of predominantly arable fields, and small nucleated settlements, with the two largest settlements in the area Boston and Spalding, surrounded by much smaller settlements. Field patterns within the Washlands are a mixture of irregular enclosures which have their origin in the medieval period, and blocks of post-medieval enclosed strip fields with straight boundaries, often amalgamated into larger fields through modern boundary loss (Ref 17).
- 5.5.45 The population increase of the 12<sup>th</sup> and 13<sup>th</sup> centuries occurred during a period of medieval reclamation of the Fenlands, and an increase in the settlement of the Washlands. Remnants of land reclamation and protection are still evident within the landscape, with the Roman Sea Bank and its associated earthworks, and Hurdletree Bank still visible today.
- 5.5.46 The HLCZ is characterised by large straight and embanked river channels, such as the River Wellend, and much smaller rivers and canals interspersed throughout the landscape. During the later medieval period, the enclosure of small areas of meadows and grazing land occurred, leading to the ploughing and the laying out of large-scale land drainage.
- 5.5.47 Both zones underwent reclamation in the 17<sup>th</sup> and 18<sup>th</sup> centuries, with drainage of the land leading to the development of post-medieval villages and hamlets on the seaward side of the 'Roman Bank', and inland of the sea bank. New roads, and isolated farmsteads, were established shortly after the reclamation, serving the newly enclosed fields.

## Future Baseline

- 5.5.48 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.
- 5.5.49 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and**

### **Scope Annex A 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.

- 5.5.50 The baseline details as presented above (including changes to settings of the assets) are not anticipated to change in the absence of the Project. Any change to archaeological remains, historic buildings and structures and historic landscape features would be limited to the existing and ongoing degradation of their fabric over time through processes such as erosion, desiccation, corrosion or decay.

## **5.6 Design, Control and Additional Mitigation Measures**

### **Design Mitigation Measures**

- 5.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 18) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 19) which apply to the design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 20) 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.
- 5.6.2 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.

### **Control Mitigation Measures**

#### **Construction**

- 5.6.3 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 Historic Environment assessment of Section 5 include:
- i. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerk of Works (EnvCoW) 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.
  - ii. GG06: A Construction Environmental Management Plan (CEMP), a Landscape Environmental Management Plan (LEMP), a Material Waste Management Plan

(MWMP), a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Right of Way Management Plan (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’.

- iii. GG09: Where sensitive features such as ancient woodland and protected habitats are to be retained within or immediately adjacent to the Order Limits, an appropriate protective area will be established using appropriate fencing and signage and will be inspected, repaired, and replaced as necessary. The protective areas will be shown on the Retention and Reinstatement Plans contained within the LEMP.

5.6.4 In addition, measures that relate to the historic environment either directly or through measures applied for landscape and visual, and noise and vibration include:

- i. H01: Known heritage assets and locations known archaeological interest will have been identified by a programme of desk-based assessment and field evaluation prior to construction. Wherever possible identified heritage assets and archaeological remains will be avoided by the Project design. Where avoidance has not been possible, archaeological mitigation measures comprising the preservation of archaeological remains, or a programme of archaeological investigation will be implemented. Areas of archaeological preservation, or where archaeological work is planned, will be demarcated using appropriate fencing and signage to prevent unintentional damage. The fencing and condition of the areas will be inspected, repaired, and replaced as necessary. The areas of archaeological preservation or investigation will be identified on plans within the OWSI and CEMP.
- ii. H02: Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of application, the Project will inform the relevant authorities and will agree a solution that protects the significance of the new discovery, so far as is practicable, within the Project parameters.
- iii. H03: An outline process for dealing with the unexpected discovery of archaeological remains including human remains and Treasure during construction will be set out in the OWSI and detailed CEMP.
- iv. H04: Where practicable, the Project will maintain elements within the historic landscape such as vegetation and hedgerows (including re-instating hedgerows and fences).
- v. 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 LEMP. 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.

- vi. LV04: Construction lighting will be of the lowest luminosity necessary to safely perform tasks. Lighting will be directional and minimised where possible.
  - vii. 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.
- 5.6.5 The requirements for, and scope of, archaeological control measures and additional mitigation will be set out in the OWSI and the CEMP submitted as part of the DCO application setting out how the requirements for archaeological control measures at each stage of construction will be implemented.
- 5.6.6 The archaeological and historic environment control measures required for the Project will be informed by the results of the forthcoming desk-based assessment, aerial photographic and LiDAR assessment, geoarchaeological desk study and the programme of pre-application archaeological evaluation comprising geophysical survey, archaeological trial trenching and geoarchaeological borehole survey. The results of the programme of archaeological evaluation will identify the presence/absence of buried archaeological assets within Section 5 and characterise their extent, depth, date, state of preservation and significance. As such, specific control measures for individual archaeological assets will be included in the ES and OWSI submitted as part of the DCO application.
- 5.6.7 The strategy and approach for appropriate archaeological and historic environment control measures to reduce or offset the identified impacts from construction and operation of the Project upon heritage assets, will be determined (where possible) in consultation with the heritage stakeholders from the respective local planning authorities and, where required, Historic England.

## Additional Mitigation Measures

- 5.6.8 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.
- 5.6.9 Potential additional mitigation measures which may be required to reduce the effects of the Project upon Historic Environment are in the early stages of development, based upon an iterative process informed by ongoing survey and assessment. These typically include additional measures which specifically serve a mitigation function, to reduce the scale of potential impacts.
- 5.6.10 Where it is not possible to implement embedded mitigation, or to avoid impacts to earthwork remains or buried archaeological deposits, measures to reduce or offset those impacts would be required to manage the historic environment resource and may include (but not be limited to):
- i. An appropriate programme of archaeological investigation and recording, with the objective of advancing the understanding of the significance of archaeological remains within Section 5 that may be disturbed or either wholly or partially lost, in accordance with the guidance provided by the Overarching National Policy Statement (NPS) for Energy (EN-1) (Ref 11);
  - ii. Appropriate archaeological and geoarchaeological investigation and recording will be undertaken prior to the commencement of construction works, wherever

possible, but may also include archaeological monitoring and recording (watching brief) works during construction; and

- iii. Establishing an outline process for dealing with the unexpected discovery of archaeological remains including human remains and Treasure during construction within the OWSI and detailed CEMP.

- 5.6.11 Opportunities for further mitigation or enhancement will be reviewed as the Project develops, the results of the site walkover surveys and archaeological surveys become available and will be included in the assessment presented in the ES and OWSI submitted with the DCO application.
- 5.6.12 Any measures to be included within the Project will be informed by further design development and consultation with the relevant stakeholders, including engagement with the statutory consultees.
- 5.6.13 Finalised additional mitigation measures will be detailed within the ES.

## 5.7 Preliminary Assessment of Effects

- 5.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors identified within the Section 5 Study Area, as a result of construction, operational and/or maintenance activities.
- 5.7.2 The preliminary assessment of effects reported below takes into account the Design and Control measures, as previously described.
- 5.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this section in **Table 5.4** based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 5.7.4 Unless stated otherwise all likely significant and non-significant effects reported below are adverse in nature.
- 5.7.5 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

- 5.7.6 The preliminary assessment of the effects arising from construction of Section 5 of the Project is described in this section. The preliminary assessment considers the design, control and additional mitigation measures described in Section 5.6.
- 5.7.7 Potential impacts that may occur during the construction phase include direct physical impacts on heritage assets within Section 5 resulting from construction works e.g. topsoil stripping and groundworks for construction access routes, pylon working areas, construction compounds and drainage.
- 5.7.8 Setting impacts arising from the construction phase on heritage assets may arise due to:

- i. Temporary short-term impacts from construction activities which can be incremental until construction is completed caused by the movement of mechanical plant, light, noise pollution and dust; and
- ii. Permanent long-term impacts as a result of the introduction of the physical form and appearance of the built infrastructure into the landscape during the construction stage and continuing for the operational duration of the Project.

### Designated Heritage Assets

5.7.9 The preliminary assessment has identified six designated heritage assets within the 3 km Section 5 Study Area that have the potential to experience temporary and/or permanent significant effects. These include one scheduled monument, one grade I listed building and four grade II listed buildings.

### Designated Assets within the 3 km Section 5 Study Area.

5.7.10 Situated to the north east of the Refined Siting Zone are two grade II listed buildings, Wraggmarsh House Farmhouse (NHLE 1147603) and Pigeoncote to the South of Wraggmarsh House (NHLE 1064477). The Farmhouse is located approximately 100 m from the Refined Siting Zone, whilst the Pigeoncote is closest at approximately 48 m. The Pigeoncote dates to around 1740 so is not contemporary with the Farmhouse which dates from about 1800, although their proximity and possible historical association forms part of their immediate setting. The two listed assets are located approximately 60 m apart with the non-designated Wragg Marsh tramway (MLI22401) recorded once running between them. The Farmhouse (NHLE 1147603) stands two storeys tall with a three bay front and the principal elevation facing south west towards the Pigeoncote and Refined Siting Zone, partially screened by mature trees. The Pigeoncote (NHLE 1064477) is located in an isolated position in the middle of a field, comprising a circular plan form of two storeys built of red brick with a conical slate roof and tall weathervane. There are wide open views from and to the Pigeoncote across Lord's Drain, along Marsh Road and the agricultural land within Section 5. The wider setting of the Farmhouse and Pigeoncote comprises the surrounding rural countryside which contributes to the functional context and understanding of these assets. The proximity and intervisibility of these two medium value designated heritage assets to the construction activities, and depending on the location of the proposed infrastructure within Section 5, are likely to result in temporary and permanent significant effects.

5.7.11 To the south west, the Refined Siting Zone abuts the north east boundary of the scheduled monument of Wykeham Chapel moated monastic grange constructed in the 14th century (NHLE 1019096) and the grade I listed Wykeham Chapel of St Nicholas (NHLE 1064471). Two grade II listed assets also form part of this group, the Chapel Farmhouse (NHLE 1147513) and associated gate piers (NHLE 1064472). Wykeham Chapel comprises a medieval moated monastic grange with the remains of a retreat house and chapel. The grange was associated with Spalding Priory which was originally a dependency of Crowland Abbey before the priory was refounded under the abbey of St Nicholas at Angers in 1074, gaining independence from the abbey in 1397. The grade I Wykeham Chapel of St Nicholas (NHLE 1064471) was built as a domestic chapel at Wykeham Hall, the country residence of the Prior of Spalding in 1311. The roof of the chapel collapsed in the late 18<sup>th</sup> century, and it fell into disuse. Built of limestone ashlar it measures approximately 13 m by 6.5 m. The standing remains of the chapel and the adjoining graveyard, situated at the centre of the moated grange, are included in the scheduled designation. The scheduled



moated island is rectangular, measuring 270 m by 140 m, with the centre of the island raised above the surrounding ground level, indicating the location of the earlier house. Standing 20 m to the south west of the Chapel is the late 17<sup>th</sup> century grade II Chapel Farmhouse (NHLE 1147513) which is constructed of red brick with some limestone ashlar dressings. The principal elevation of the farmhouse faces south towards the 18<sup>th</sup> century grade II listed pair of gate piers (NHLE 1064472). The Chapel (NHLE 1064471) and farmhouse (NHLE 1147513) are set within the moated site of the scheduled monument (NHLE 1019096) but are excluded from the scheduling. The scheduled site is bounded by mature trees, with a later farmstead located to the south east which is outside of the scheduled area. The setting of these buildings strongly contributes to their value, with the surrounding agricultural landscape forming their wider setting. The proximity and potential intervisibility with the Refined Siting Zone will, depending on the location of the proposed substation(s) and overhead line infrastructure, result in temporary and permanent likely significant effects to these high and medium value assets.

### Non-designated Heritage Assets within Section 5

- 5.7.12 Five historic farmsteads are located within land excluded from the Section 5 boundary. These comprise Crowtree Farm, Weston (MLI122916); Bottom Yard, Weston (MLI122915); White House Farm, Weston (MLI122917); Top Yard, Weston (MLI122919) and Shepherds Farm, Weston (MLI122924). These 19<sup>th</sup> century low value farmsteads vary in completeness from partial loss of less than 50% of traditional buildings (MLI122919) through to the complete redevelopment of the farmstead, leaving only the historic interest of Bottom Yard, Weston (MLI122915). Due to their proximity with the Project, located within land excluded from, but surrounded by the Refined Siting Zone boundary, there is, depending on the location of the proposed substation(s) and overhead line infrastructure, potential for these assets to experience temporary and permanent likely significant effects as a result of changes to their setting.
- 5.7.13 There are no archaeological non-designated heritage assets within Section 5 that will experience likely significant effects.

### Non-designated Heritage Assets within the 1 km Section 5 Study Area

- 5.7.14 The preliminary assessment has identified one non-designated built heritage asset within the 1 km Section 5 Study Area that may experience significant effects as a result of the Project.
- 5.7.15 Welland House Farm (Welland House), Weston (MLI122918) is located just to the west of Section 5 which surrounds the property except to the north west. Welland House is a partially extant 19<sup>th</sup> century farmstead which is shown on the First Edition OS map to include a regular courtyard with multiple regular yards and a detached farmhouse. Modern agricultural sheds have replaced some of the historic structures to the east of the farmhouse, resulting in the loss of the courtyard plan and diminishing the immediate setting of the farmhouse. The setting of this non-designated heritage asset is the surrounding agricultural landscape, particularly to the east and south. To the west, the asset is located in close proximity to the River Welland and Vernatt's Drain. Due to the proximity of this low value asset to Section 5 and depending on the location of the proposed substation(s) and overhead line infrastructure, potential for these assets to experience temporary and permanent likely significant effects.

## Operation

- 5.7.16 Impacts during the operation of the Project that may affect heritage assets include:
- i. security lighting with motion detectors;
  - ii. operational noise; and
  - iii. restrictions on accessibility to heritage assets.
- 5.7.17 In accordance with the PINS Scoping Response (Ref 2; Section 3.4, ID. 3.4.2), the assessment of physical impacts to, or changes to the settings of heritage assets, as a result of maintenance activities and traffic, have been scoped out of the preliminary assessment as they are unlikely to result in significant effects.
- 5.7.18 Although no additional significant effects are considered likely through operation, over and above those already identified relating to the long-term presence of the Project in the landscape assessed under the construction phase, further assessment of these operational elements will be undertaken in the ES.

## Likely Non-Significant Effects

### Construction

#### Designated Heritage Assets

- 5.7.19 A number of designated heritage assets, which may experience non-significant effects, have been identified warranting further explanation of their assessment due to particular sensitivities, such as their high value, designed views, historic setting or their proximity to works proposed within Section 5. For completeness **Table 5.4** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant effects.
- 5.7.20 The Pinchbeck Engine scheduled monument (NHLE 1004966) is a 19<sup>th</sup> century beam engine used for clearing Pinchbeck Marsh located 1 km west of Section 5. The engine and boiler are housed in a red brick engine house with date stone of 1833 which is designated as a grade II listed building (NHLE 1146782). The setting of the monument and grade II listed engine house comprises the pumping station, associated structures and the adjacent channels and watercourses which fed the pumping station and were used to manage water levels within the surrounding marsh. Existing tree lined shelter belts to the east of the monument provide screening from the Project and therefore it is anticipated that any changes to the setting of the monument and grade II listed engine house will not result in significant effects.
- 5.7.21 Pinchbeck Conservation Area includes a number of listed buildings comprising the grade I Church of St Mary (NHLE 1064433) and 12 grade II listed buildings. The conservation area is located approximately 2.5 km west of the Section 5 at its closest point. The conservation area focuses on the historic core of the settlement and includes a number of 18<sup>th</sup> and 19<sup>th</sup> century structures alongside the parish church which has medieval origins. The conservation area retains much of its historic layout, despite modern infill and the expansion of the settlement to the north, west and south, beyond the conservation area boundary. To the east, the conservation area's setting is the surrounding rural countryside which contributes to the understanding of this historically rural settlement. The Project does not form part of the setting of the

conservation area and its listed assets, it is therefore anticipated that any impacts arising from Section 5 would not result in significant effects.

- 5.7.22 There is a cluster of designated heritage assets within the settlement of Weston comprising one scheduled monument, the Churchyard Cross, St Mary's Churchyard (NHLE 1013529) which is also grade II listed (NHLE 1064473), the grade I listed Church of St Mary (NHLE 1064475) and five grade II listed buildings which are located within the 3 km Section 5 Study Area. The nearest to Section 5 is the grade II listed Tomb Chest Approximately three Metres South of Church (NHLE 1147556) located approximately 300 m to the south west. A number of these heritage assets centre around the Church of St Mary (NHLE 1064475) comprising the churchyard cross (NHLE 1013529; 1064473), Tomb Chest (NHLE 1147556), seven Gravestones (NHLE 1064474) and the Lychgate (NHLE 1147551). The church is set within its churchyard which contains these heritage assets and is bounded by mature trees to the north and east. The remaining listed buildings comprise the 18<sup>th</sup> century Oakleigh House (NHLE 1261851) and its associated barn (NHLE 1147591). The setting of the church extends to Section 5 which is within the parish of Weston which the church serves. The impacts of the Project on these designated assets in Weston are not anticipated to result in significant effects.

#### Non-designated Assets

- 5.7.23 The preliminary assessment has identified non-designated heritage assets within the Refined Siting Zone and the 1 km Section 5 Study Area that have the potential to experience temporary or permanent non-significant effects. A number of these assets have been identified that require further explanation of their assessment due to particular sensitivities, such as their historic setting or their proximity to Section 5.

#### Non-designated Assets within Section 5

- 5.7.24 A number of non-designated heritage assets comprising buried archaeological remains have been identified within the Refined Siting Zone. Further archaeological surveys and evaluation is required to fully understand the extent, date and character of the remains and to inform the need for additional mitigation measures where appropriate. A preliminary assessment has been undertaken for each asset based on the information available at the time of writing. These preliminary assessments will be updated in the ES.
- 5.7.25 Tramway, Wragg Marsh (MLI22401) is an asset of low value that extends through the northern part of the Refined Siting Zone. The tramway dates to the 19<sup>th</sup> century and extends from Weston Barn House in the south and Fosdyke Bridge in the north. In the event that this asset cannot be avoided by construction of the Project, possible impacts including topsoil stripping and groundworks would have the potential to truncate or disturb a small section of the asset, which is likely to result in a permanent non-significant effect.
- 5.7.26 A medieval Sea Bank in Weston (MLI98445), is an asset of medium value that extends across the centre of the Refined Siting Zone. The asset was originally identified as Roman Bank on the 1905 OS map; however, the asset is medieval in date and was likely constructed in the 12<sup>th</sup> or 13<sup>th</sup> century. The asset survives as an extant earthwork. In the event that this asset cannot be avoided by construction of the Project, possible impacts including topsoil stripping and groundworks would have the potential to truncate or disturb a small section of the asset, which is likely to result in a permanent non-significant effect. The long term presence of the Project in the

landscape may also impact the setting of the asset; however existing 400 kV and 132 kV overhead lines already form a negative feature within the setting of the asset and the addition of the Project would not result in a significant effect.

- 5.7.27 Two non-designated heritage assets are recorded in the southern part of the Refined Siting Zone, comprising undated ditches (MLI87291) and an undated enclosure (MLI87292) at Wool Hall Farm, Wykeham. Both assets are assessed as being of low value with the potential to contribute to the understanding of local settlement patterns. In the event that these assets cannot be avoided by the construction of the Project, possible impacts including topsoil stripping and groundworks would have the potential to partially truncate or disturb part of the buried remains. In each case this is likely to result in permanent, but non-significant effects.
- 5.7.28 Undated natural watercourses (MLI86087) have been recorded at the southern boundary of the Refined Siting Zone. The asset represents a series of silted up, creeks and channels associated with a system of watercourses identified from aerial photographs and are assessed as being of low value. If the asset cannot be avoided by construction of the Project, possible impacts including topsoil stripping and groundworks for the construction access route or pylon working areas would have the potential to partially truncate or disturb part of the asset. This would result in a permanent, but non-significant effect.
- 5.7.29 The undated ditches on land at Woolhall Farm, Weston (MLI86088) is an asset of low value and is located partially within the Refined Siting Zone. If the asset cannot be avoided by construction of the Project, possible impacts including topsoil stripping and groundworks for the construction access route or pylon working areas would have the potential to partially truncate or disturb part of the asset. This would result in a permanent, but non-significant effect.
- 5.7.30 Undated trackway cropmarks to the north west of Wool Hall Farm (MLI89824) is an asset of low value and is located partially within the south west corner of the Refined Siting Zone. The asset comprises the buried remains of a linear trackway identified through aerial photography. If the asset cannot be avoided by construction of the Project, possible impacts including topsoil stripping and groundworks would have the potential to truncate or disturb part of the asset. This would result in a permanent, but non-significant effect.
- 5.7.31 Four former 19<sup>th</sup> century farmsteads recorded by documentary sources, but now demolished, have been identified within the Refined Siting Zone, including Poorland Farm, Surfleet (MLI122571), School Farm, Weston (MLI122914), Marsh House, Weston (MLI122921) and an Unnamed Farmstead, Weston (MLI122922). These four assets are assessed as having a negligible heritage value, with little surviving archaeological interest. In the event that the locations of these assets cannot be avoided by the construction of the Project their poor survival means that impact such as topsoil stripping and groundworks would not result in significant effects.

#### Non-Designated Heritage Assets within the 1 km Study Area

- 5.7.32 Moated Site (MLI20329) is an asset of low value and is located approximately 90 m east of Section 5. The asset comprises the remains of an earthwork moat and although undated, it likely dates to either the medieval or post-medieval period. The Project will not impact the physical remains of the asset, which is well screened by existing vegetation. While the Project would be located in the wider setting of the asset it is not anticipated that temporary impacts arising from the construction or the long term presence of the Project in the landscape would result in significant effects.

- 5.7.33 Medieval Salterns (MLI23633) is an asset of medium value located within the 1 km Section 5 Study Area. The asset is comprised of an extensive group of saltern sites, running on a north to south alignment along the western side of the River Welland sited approximately 630m west of Section 5. The salterns comprise buried archaeological remains and extant earthworks and likely date to the 13th century. The long term presence of the Project in the agricultural landscape east of the salterns, may also impact the wider setting of the asset; however existing 132 kV overhead lines already form a negative feature within the setting of the asset and the addition of the Project would not result in a significant effect.
- 5.7.34 The Ship Inn, Surfleet Seas End, Surfleet (MLI87121) is located approximately 245 m west of Section 5. It is a partially extant 19<sup>th</sup> century farmstead with a loose courtyard plan visible on the First Edition OS map; however, it is thought that The Ship Inn might have origins in the 17<sup>th</sup> century when it was associated with the drainage of the fens. There has been significant loss of traditional buildings with modern development encroaching on its isolated setting. The principal elevation of The Ship Inn is to the south east, overlooking the River Glen and the surrounding rural countryside which contributes to its setting and the understanding of its historic use. The setting of The Ship Inn is informed by its relationship with the waterways and rural countryside through its potential origins and associations with Scottish and Irish prisoners of war and Dutch labourers who all worked on the drainage of the fens in the 17<sup>th</sup> century. This asset is not anticipated to experience significant effects from the construction of the Project, although Section 5 is within its wider setting which, depending on the location of the proposed substation(s) and overhead line infrastructure, would be altered.
- 5.7.35 Chestnut House (White House), Weston (MLI122926) is located approximately 75 m south east of Section 5, at the junction of Wiseman's Gate and Stone Gate. It comprises a partially extant 19<sup>th</sup> century farmstead with a loose cluster of traditional buildings. The First Edition OS map shows the farm to include a T-plan range with a regular courtyard and an additional detached farmhouse range. It appears that a number of these structures have been lost and replaced with modern agricultural buildings to the north and a modern property to the north west. The farmhouse has been extended to the north with its principal elevation facing south screened by trees. The parish of Weston's Tithe Apportionment of 1838 shows the historic land parcels associated with Chestnut House to extend to the north and east of the farmstead. This historic landholding informs the wider functional setting of the non-designated heritage asset which extends into Section 5. This asset is not likely to experience significant effects as a result of the construction of the Project.
- 5.7.36 Church Farm, Weston (MLI122927) is located approximately 350 m south east of Section 5. It comprises a 19<sup>th</sup> century farmstead of which the farmhouse is the only surviving historic structure. The First Edition OS map shows the farmhouse with two detached outbuildings. It is thought to be part of a church and/or manor grouping and its location next to the Church of St Mary (NHLE 1064475) provides its setting and contributes to its understanding and interest. To the north modern housing and large warehouse developments have severed the connection between the redeveloped farmhouse and its historic landholdings which extended to the north, eroding the historic setting of the asset. This wider setting extends into Section 5 demonstrated by the Tithe Apportionment of 1838. The principal elevation of the farmhouse faces east onto High Road. This asset is not likely to experience significant effects as a result of the construction of the Project.

## **Operation**

- 5.7.37 No additional non-significant effects are considered likely through operation, over and above those already identified relating to the long-term presence of the Project in the landscape assessed under the construction phase, further assessment of these operational elements will be undertaken in the ES.

Table 5.4 Preliminary overview of non-significant Historic Environment effects – Section 5

Heritage Asset	Value of the Asset	Potential Impact	Likely Non-Significant Effect	Rationale
<b>Designated Assets within the 3 km Section 5 Study Area</b>				
Scheduled Monuments	High	Potential temporary change to the setting or value of the assets arising from the construction of the Project and potential permanent change to setting or value of the assets arising from the construction of the Project and throughout its operational duration.	2	There are three scheduled monuments within the 3 km Section 5 Study Area, with one predicted likely to experience significant effects. The remaining to scheduled monuments are not anticipated to experience changes to their setting, or the way in which they are experienced or understood, that would result in significant effects.
Grade I listed buildings	High	Potential temporary change to the setting or value of the assets arising from the construction of the Project and potential permanent change to setting or value of the assets arising from the construction of the Project and throughout its operational duration.	3	There are four grade I listed buildings within the 3 km Section 5 Study Area, with one predicted to experience likely significant effects. The remaining three grade I listed buildings are not anticipated to experience changes to their setting, or the way in which they are experienced or understood, that would result in significant effects.
Grade II* listed buildings	High	Potential temporary change to the setting or value of the assets arising from the construction of the Project and potential permanent change to setting or value of the assets arising from the construction of the Project and throughout its operational duration.	0	There are no grade II* listed buildings within the 3 km Section 5 Study Area.

Heritage Asset	Value of the Asset	Potential Impact	Likely Non-Significant Effect	Rationale
Conservation Areas	Medium	Potential temporary change to the setting or value of the assets arising from the construction of the Project and potential permanent change to setting or value of the assets arising from the construction of the Project and throughout its operational duration.	1	The Project does not form part of the setting of the Pinchbeck Conservation Area and will not alter its value or the way it is appreciated or understood. This asset is not anticipated to experience any significant effects.
Grade II listed buildings	Medium	Potential temporary change to the setting or value of the assets arising from the construction of the Project and potential permanent change to setting or value of the assets arising from the construction of the Project and throughout its operational duration.	21	Four of the grade II listed buildings within the Study Area are located in close proximity to Section 5 which forms part of their setting, and these assets are likely to experience significant effects as a result of the Project. The remaining 21 grade II listed buildings are not anticipated to experience changes to their setting, or the way in which they are experienced or understood, that would result in significant effects.

#### Non-designated Heritage Assets within Section 5

	Medium or Low	Permanent physical construction impacts resulting in the partial loss or disturbance of the asset.	11	Eleven non-designated heritage assets of medium or low value, have the potential to experience partial loss or disturbance resulting in effects that are not significant. Archaeological mitigation measures i.e. appropriate archaeological investigation and recording would
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Heritage Asset	Value of the Asset	Potential Impact	Likely Non-Significant Effect	Rationale
				further off-set or reduce these effects.
	Medium or Low	Potential temporary change to the setting or value of the assets arising from the construction of the Project and potential permanent change to setting or value of the assets arising from the construction of the Project and throughout its operational duration.	11	Eleven non-designated heritage assets of medium or low value, have the potential to experience changes to their setting and heritage value, or the way in which they are appreciated and understood, resulting in effects that are not significant.

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#### Non-designated Heritage Assets within 1 km Study Area

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	Medium or Low	Potential temporary change to the setting or value of the assets arising from the construction of the Project and potential change to setting or value of the assets arising from the construction of the Project and throughout its operational duration.	42	<p>A single non-designated farmstead located within the 1 km Section 5 Study Area, has the potential to experience temporary and permanent significant effects as a result of possible changes to its setting due to the Project.</p> <p>The remaining 42 non-designated heritage assets are not anticipated to experience changes to their setting, heritage value, or the way in which they are appreciated and understood, that would result in significant effects.</p>
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## **5.8 Monitoring**

- 5.8.1 The control measures set out in section 5.6 of this chapter include provision for monitoring of the programme of additional archaeological mitigation measures by the Environmental Manager or Archaeological Clerk of Works (ACoW), in consultation with the Local Planning Authority. As such, no further requirement for monitoring the historic environment is anticipated at this time.

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# **6. Water Environment and Flood Risk**

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# 6. Water Environment and Flood Risk

## 6.1 Introduction

- 6.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Water Environment and Flood Risk assessment for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (section 5) of the Grimsby to Walpole Project (the Project).
- 6.1.2 The assessment for Section 5 is based on a Refined Siting Zone Boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 6.1.3 Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 6.1);
  - ii. Identification of key local and regional policy relevant to the assessment (section 6.2). 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 Water Environment and Flood Risk assessment (section 6.3). 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 Water Environment and Flood Risk assessment within Section 5 (section 6.4). 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 Section 5 Study Area relevant to the Water Environment and Flood Risk assessment (section 6.5);
  - vi. A description of mitigation measures included for the purposes of the Water Environment and Flood Risk assessment reported within the PEI Report (section 6.6). 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 Water Environment and Flood Risk effects arising during construction and operation of the Project within Section 5 based upon the assessment completed to date (section 6.7); and

viii. An outline of the proposed monitoring requirements in relation to Water Environment and Flood Risk effects (section 6.8).

6.1.4 Further supporting information is set out in **Table 6.1** below, including supporting figures and technical appendices.

Table 6.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 6.1 Water Environment Receptors and Study Area</b> <b>Figure 6.2 Principal Local Water Environment Regulators</b> <b>Figure 6.3 Surface Water Flood Risk</b> <b>Figure 6.4 Water Framework Directive Surface Water Body Status</b>
<b>PEI Report Volume 3 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment</b>	Preliminary assessment of the potential flood risk in relation to the Project, which sets out further assessment to be completed in support of the Environmental Statement (ES) and Development Consent Order (DCO) application. The emerging outcomes of ongoing pre-application consultation with key flood risk stakeholders are referenced as appropriate.
<b>PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Assessment</b>	Preliminary assessment of the potential implications of the Project with respect to compliance with the Water Framework Directive (WFD).
<b>Project Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).



Supporting Information	Description
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 6.1.5 There are also interrelationships between the potential effects on Water Environment and Flood Risk 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 5 Chapter 4 Ecology and Biodiversity** considers the effects identified by the surface water environment assessment that may affect ecological receptors, including aquatic flora and fauna.
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology** considers the effects identified by the surface water environment assessment that may affect hydrogeological receptors.
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
  - iv. **PEI Report Volume 2 Part C Route-wide Chapter 5 Water Environment** presents a summary of the route-wide preliminary impacts and likely significant effects of the Project upon the water environment.

- v. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.

## 6.2 Legislation and Policy Framework

### Legislation and National Policy

- 6.2.1 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 6.1**.

### Regional and Local Policy

- 6.2.2 Regional and local plans or policies relevant to this assessment are as follows:
  - i. Lincolnshire Minerals and Waste Local Plan (2016) (Ref 1);
  - ii. Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050 (2019) (Ref 2);
  - iii. South East Lincolnshire Local Plan (Adopted March 2019) (Ref 2); and
    - Policy 2 Development Management: states that development proposals requiring planning permission will be permitted provided that sustainable development considerations are met, specifically in relation to factors including sustainable drainage and flood risk and impacts or enhancement of areas of natural habitats;
    - Policy 3 Design of New Development: all development must use high quality and inclusive design which demonstrates how issues including, but not limited to, the mitigation of flood risk through flood-resistant and flood-resilient design and sustainable drainage systems will be secured.
    - Policy 4 Approach to Flood Risk: states that development proposed within an area at risk of flooding will be permitted where it can be demonstrated that there are no other sites available at a lower risk of flooding, that essential infrastructure provides wider benefits that outweigh flood risk and that the application is supported by a site-specific flood risk assessment.
    - Policy 30 Pollution: outlines that development proposals will not be permitted where, taking account of any proposed mitigation measures, they would lead to unacceptable adverse impacts upon health and safety of the public, amenities of the area and the natural, historic and built environment by way of surface and groundwater quality.
    - Policy 31 Climate Change and Renewable and Low Carbon Energy: with the exception of wind energy, the development of renewable energy facilities and associated infrastructure will be permitted, provided that individually, or cumulatively, there would be no significant harm to, amongst other factors, the natural environment.

- iv. South Holland Drainage Board Byelaws (2013) (Ref 4) and Welland and Deepings Internal Drainage Board (2022) (Ref 5).
  - These byelaws are intended to secure the efficient working of the drainage system within the Board’s district, including regulating environmental effects and promoting effective flood risk management.

## 6.3 Scope of Assessment

- 6.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 6) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 7). 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 Landscape 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**.
- 6.3.2 Non statutory consultation feedback has been addressed within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 6.3.3 Aspects of the Water Environment and Flood Risk which are included within the scope of the assessment are summarised in **Table 6.2**.
- 6.3.4 It should be noted that the operational phase impacts on aquatic environment and water resource receptors arising from overhead line aspects of the project were scoped out of the assessment at scoping stage and are therefore not considered further in this chapter, in accordance with the Scoping Opinion.

Table 6.2 Water Environment and Flood Risk effects scoped in for further assessment

Receptor	Relevant Assessment Criteria	Potential Effects Considered
<b>Construction Phase</b>		
<b>Aquatic environment receptors</b> , comprising: <ul style="list-style-type: none"> <li>- Main rivers</li> <li>- WFD river and transitional waterbodies</li> <li>- IDB-maintained watercourses</li> <li>- Ordinary watercourses</li> </ul>	WFD and WFD (Standards and Classification) Directions (England and Wales) 2015 (Ref 8).	<ul style="list-style-type: none"> <li>• Deterioration in the water quality of aquatic environment receptors via generation of sediment laden run-off as a result of construction activities, e.g. watercourse crossings and excavations.</li> <li>• Potential effects on the hydromorphology and flow conveyance as a result of increased sediment inputs or direct watercourse disturbance (including from new watercourse crossings).</li> <li>• Deterioration in the water quality of aquatic environment receptors affected by mobilisation of contaminants from contaminated</li> </ul>
<b>Water resource receptors</b> , comprising: <ul style="list-style-type: none"> <li>- Licensed surface water abstractions</li> </ul>		

Receptor	Relevant Assessment Criteria	Potential Effects Considered
<ul style="list-style-type: none"> <li>- Unlicensed surface water abstractions for private water supply</li> <li>- Discharges to surface waters</li> </ul>		<p>soil, or accidental spillage of pollutants (e.g. fuel or oil).</p> <ul style="list-style-type: none"> <li>• Deterioration in the water quality of aquatic environment receptors affected by mobilisation of contaminants in groundwater and subsequently surface water.</li> <li>• Impact from any dewatering for construction from temporary works impacting groundwater – surface water interactions.</li> <li>• The potential effects noted above for surface water aquatic environment receptors could also have implications for surface water resource availability.</li> </ul>
<p><b>Flood risk receptors</b> (property and infrastructure at risk of flooding)</p>	<p>National Planning Policy Framework (NPPF) (Ref 9)</p>	<ul style="list-style-type: none"> <li>• Changes to watercourse flow conveyance arising from the presence of new or modified temporary watercourse crossings. This has the potential not only to affect the morphology of aquatic environment receptors, but to increase the risk of flooding to flood risk receptors.</li> <li>• Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces, and to changes in surface water runoff pathways due to changes in ground surface levels.</li> <li>• Changes to fluvial flood risk associated with loss of floodplain storage and/or change in floodplain flow conveyance.</li> <li>• Changes to fluvial flood risk associated with compartmentalisation of the floodplain.</li> <li>• Impacts on the integrity of flood defence and land drainage infrastructure as a result of physical impingement of Project infrastructure.</li> </ul>

Receptor	Relevant Assessment Criteria	Potential Effects Considered
<b>Operational Phase</b>		
<p><b>Aquatic environment receptors</b>, comprising:</p> <ul style="list-style-type: none"> <li>- Main rivers</li> <li>- WFD river and transitional waterbodies</li> <li>- IDB-maintained watercourses</li> <li>- Ordinary watercourses</li> </ul> <p><b>Water resource receptors</b>, comprising:</p> <ul style="list-style-type: none"> <li>- Licensed surface water abstractions</li> <li>- Unlicensed surface water abstractions for private water supply</li> <li>- Discharges to surface waters</li> </ul>	<p>WFD and WFD (Standards and Classification) Directions (England and Wales) 2015 (Ref 8).</p>	<ul style="list-style-type: none"> <li>• Deterioration in the water quality of aquatic environment receptors due to a spill or leakage of fuels/chemicals during periodic maintenance and refurb activities. These activities are unlikely to require heavy plant, or excavations or the need to construct new temporary access roads.</li> <li>• The potential effects noted above for surface water aquatic environment receptors could also have implications for surface water resource availability.</li> </ul>
<p><b>Flood risk receptors</b> (property and infrastructure at risk of flooding)</p>	<p>NPPF (Ref 9)</p>	<ul style="list-style-type: none"> <li>• Changes to surface water flood risk due to changes in runoff rates resulting from creation of impermeable surfaces, and to changes in surface water runoff pathways due to changes in ground surface levels.</li> <li>• Changes to fluvial flood risk associated with loss of floodplain storage and/or change in floodplain flow conveyance.</li> </ul>

6.3.5 The receptor types identified in **Table 6.2** are briefly introduced below. Features in these three classes are only identified as receptors where they intersect with the Section 5 Study Area for Water Environment and Flood Risk, as defined in section 6.5.

## Aquatic Environment Receptors

6.3.6 The basic unit for identification of aquatic environment receptors is WFD surface waterbodies, as defined in the Environment Agency (EA) Cycle 3 River Basin Management Plans (RBMPs) (Ref 10) or water-dependent designated nature conservation sites. This is to allow alignment of the EIA with the WFD assessment for the Project. However, other classes of watercourse (main river, IDB-maintained watercourse, ordinary watercourse) are also identified as receptors where appropriate.

## Water Resource Receptors

- 6.3.7 Water resource receptors are defined within this assessment as surface water abstractions including their associated upstream catchment. The potential for impacts on water quality and water balance/flow regime in the catchments upstream of abstraction locations have been assessed in order to determine potential effects on the abstractions themselves. The assessment of abstractions in the Water Environment and Flood Risk topic is restricted to those from surface water sources. The potential for effects on groundwater abstractions is considered in **PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology**.
- 6.3.8 Discharges to surface water from other parties are also considered as receptors, although there is little scope for effects of the Project on discharges, apart from direct physical impingement, which will be avoided through imposition of suitable stand-off distances between working areas and discharge infrastructure.

## Flood Risk Receptors

- 6.3.9 Flood risk receptors are defined within this assessment as property and infrastructure that could be at risk of flooding. Their sensitivity is defined in terms of the flood risk vulnerability classification set out in Table 2 of the Planning Practice Guidance (PPG) on Flood Risk and Coastal Change (Ref 11) that supports the NPPF (Ref 9). It is recognised that the primary purpose of the NPPF flood vulnerability classification is to guide Flood Risk Assessment (FRA) requirements for new development, but it is also considered to be a useful tool for assessing the relative sensitivity of external receptors for flood risk effects from new development.
- 6.3.10 The preliminary assessment for flood risk reported in this chapter only considers the impact of the Project on flood risk to external receptors. An appraisal of the risks of flooding to proposed project infrastructure and activities and proposed mitigation of these risks is provided in the **PEI Report Volume 2 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment**.

## 6.4 Assessment Methodology

- 6.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Water Environment and Flood Risk 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 value, magnitude of impact and significance of effects are all described and assigned to the assessment. A summary of the key components is outlined below.
- 6.4.2 The text in this section presents a summary of the approach to the assessment of impacts arising from the Project on the surface water environment and flood risk in this PEI Report. The methodology has been applied to the construction and operation phases of the Project to provide a preliminary assessment of impacts and effects. The final approach to the assessment reported in the ES which accompanies the DCO application will be kept under review, subject to further consultation with relevant statutory bodies.
- 6.4.3 The assessment methodology is generally consistent with guidance set out in LA113 from the Design Manual for Roads and Bridges (BMRB) (Ref 12). Whilst primarily intended for use in assessing the impacts of highways projects on the water environment, the methodology is widely accepted for assessing the effects of other

types of linear infrastructure. The assessment methodology, particularly in respect to the value assigned to receptors, also draws on experience from previous electricity transmission projects, as well as having regard for the specific characteristics of the water environment in the Project Study Area.

- 6.4.4 A supporting FRA is being developed in accordance with the requirements of the Energy National Policy Statement EN-1 and EN-5, the NPPF, 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 ES. A preliminary FRA (PFRA) is included within the PEI Report as an appendix to the Water Environment and Flood Risk chapter of the Route Wide Assessment in **PEI Report Volume 3 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment**.
- 6.4.5 An assessment of compliance with the WFD will be produced in line with Nationally Significant Infrastructure Projects: Advice on the Water Framework Directive (Ref 13) and included in the ES. A summary of assessment approach and Stage 1 Screening assessment is included within the PEIR as an appendix to the Water Environment and Flood Risk chapter of the Route Wide Assessment in **PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary WFD Assessment**.
- 6.4.6 Relevant technical guidance and standards that have informed the methodology are listed in full in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

## Assessment Assumptions and Limitations

- 6.4.7 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 6.4.8 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**.
- 6.4.9 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.

## 6.5 Baseline Conditions

### Study Area

- 6.5.1 The Section 5 Study Area for the Water Environment and Flood Risk assessment includes the area within the Refined Siting Zone and extends to a 500 m buffer around the Refined Siting Zone boundary. This 500 m buffer in accordance with the Scoping Report (Ref 7) and considered an appropriate Study Area based on the nature of the Project construction and operation (and maintenance) activities, technical knowledge of similar schemes, and an understanding of source-pathway-receptor linkages for Water Environment and Flood Risk. Beyond the 500 m buffer, effects resulting from the Project are unlikely and have therefore been scoped out. This was accepted by the Planning Inspectorate (PINS) in their Scoping Opinion (Ref

6). The Section 5 Study Area is presented in **PEI Report Volume 2 Part B Section 5 Figure 6.1 Water Environment Receptors and Study Area**.

6.5.2 Given that the design of Section 5 of the Project remains in development, the Refined Siting Zone boundary is based upon a precautionary approach and extends over a greater area than that anticipated to be included within the Section 5 draft Order Limits, once these are defined. As such, the Section 5 Study Area adopted for the purposes of the PEI Report reflects a worst case scenario.

6.5.3 The following sections provide a description of the baseline environment relevant to the Section 5 Study Area.

### Data collection

6.5.4 At this stage, the Water Environment and Flood Risk baseline has been developed on the basis of a desk-based assessment of existing data, as summarised in **Table 6.3**. A site walkover will be undertaken in 2025 to supplement the data described below and inform assessment reported in the ES. The understanding obtained from the baseline data will be supplemented by subsequent consultation with relevant water and flood risk stakeholders. The baseline characterisation will therefore be refined where appropriate as data becomes available and as the details of the design are developed.

6.5.5 EA flood model outputs (including flood extent and flood depth data) for the floodplains within the Refined Siting Zone include:

- i. Main East Coast Breach Model and Report (Ref 14); and
- ii. Northern Area Tidal Modelling (NTM) East Coast Overtopping Model and Report (Ref 15).

6.5.6 The known or predicted current and future baseline environment described in this section has been informed by the data sources listed in **Table 6.3**.

6.5.7 The Flood Map for Planning is scheduled to be updated in March 2025 to represent the latest available data arising from the Environment Agency’s updated National Flood Risk Assessment (NaFRA2) (Ref 16). This PEI Report and the screening exercise presented in the PFRA is based on the information available at the time of writing. The assessment of flood risk in relation to the Project is to be updated to reflect the scheduled updates to the Flood Map for Planning as part of the FRA submitted in support of the DCO application for the Project.

**Table 6.3 Data sources used to inform baseline conditions**

<b>Data topic</b>	<b>Sources of information</b>
Climate	Met Office UK Climate averages at Holbeach (Ref 17)
Topography	Ordnance Survey Mapping (Ref 18)
Geology	British Geological Survey (BGS) Geology of Britain Viewer (Ref 19)
Soils and land use	Department for Environment, Food and Rural Affairs (DEFRA) Multi-Agency Geographic Information for the Countryside (Magic Map) online GIS portal (Ref 20); National Soil Research Institute Soilscales map viewer (Ref 21)



Data topic	Sources of information
Hydrology	Environment Agency Statutory Main River Map for England (Ref 22) Flood Estimation Handbook Web Service (Ref 23)
Flood risk	Environment Agency Flood Map for Planning (Ref 24) Environment Agency Risk of Flooding from Surface Water (RoFSW) (Ref 25) National Flood Risk Assessment (NAFRA) Dataset (Ref 16) Environment Agency Risk of Flooding from Reservoirs (Ref 26) Environment Agency Flood Defence Asset database (Ref 27) National River Flow Archive (NRFA) (Ref 28)
Water quality and Water Framework Directive status	Catchment Data Explorer database (Ref 29) of Cycle 2 and 3 WFD information
Water abstractions and discharge consents	Environment Agency abstraction and discharge consent data including active discharge locations, abstraction licence strategies and local authority private water supply datasets (Ref 30) (Ref 31)

## Survey Work

- 6.5.8 While a Water Environment and Flood Risk walkover survey was not undertaken to inform the PEI Report, this will be undertaken in 2025 with a view to informing the ES. The objective of this walkover survey will be to conduct visual inspections to characterise watercourses in terms of morphology, depth of water, depth of movement and water quality.
- 6.5.9 Therefore, the following data were not available at the time of writing this PEI Report but will be available to inform the ES:
- i. Field notes and photographs collected during watercourse surveys; and
  - ii. Aquatic ecology surveys, including:
    - General characteristics of watercourses to be crossed, including physical features such as length, depth, width, flow, water level, bed and bank substrate and bankside and in-channel vegetation cover;
    - Aquatic habitat appraisal surveys and assessments; and
    - Appraisal of potential for protected and notable species typically associated with watercourse habitats.

## Further Data Requests

- 6.5.10 To inform the Water Environment and Flood Risk assessment reported in the ES, further data requests will be made with the LLFAs and IDBs to provide information on the following:
- i. Baseline flood risk data, including available modelled flood data and local flood risk data from commissioned studies;

- ii. Further information on the location and characteristics of IDB-maintained watercourses and operation of water level management assets; and
- iii. Information on local flood risk from LLFAs (e.g. specific watercourse characteristics, local flood history, Section 19 reports, asset information and maintenance regimes).

## Existing Baseline

- 6.5.11 The following section outlines the Water Environment and Flood Risk baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:
- i. **PEI Report Volume 2 Part B Section 5 Figure 6.1 Water Environment Receptors and Study Area;**
  - ii. **PEI Report Volume 2 Part B Section 5 Figure 6.2 Principal Local Water Environment Regulators;**
  - iii. **PEI Report Volume 2 Part B Section 5 Figure 6.3 Surface Water Flood Risk;**
  - iv. **PEI Report Volume 2 Part B Section 5 Figure 6.4 Water Framework Directive Surface Water Body Status;**
  - v. **PEI Report Volume 3 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment;** and
  - vi. **PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Screening Assessment.**
- 6.5.12 A description of the works within Section 5 is provided within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section**. The details of proposed permanent works within Section 5 are subject to ongoing siting and design work. However up to two new 400 kV substation(s) are proposed (to be referred to as Weston Marsh Substation A and Weston Marsh Substation B) along with an associated overhead line between the substation(s), in the vicinity of the Spalding Tee-Point. This Tee-Point is approximately 2.5 km east of the village of Surfleet Seas End. Connecting transmission infrastructure will continue from Section 4 from north of the River Welland and is anticipated to be routed in a southerly direction towards Weston, where it will connect with overhead line in Section 6.
- 6.5.13 Section 5 is located within the South Holland District Council region and predominantly within the district of the South Holland IDB, although the Study Area to the west of the River Welland lies within the Welland and Deepings IDB district. Section 5 intersects the River Welland in the north and many ordinary and IDB-maintained watercourses as illustrated in **PEI Report Volume 2 Part B Section 5 Figure 6.2 Principal Local Water Environment Regulators**.
- 6.5.14 At this stage, baseline conditions have been assessed based upon desk-based information and will be reviewed and updated as required within the ES, based upon further field survey and data collection.

## Climate

- 6.5.15 Average annual rainfall estimates for the period 1991-2020 were taken from the Met Office website (Ref 17). This demonstrates the average annual total rainfall in the locality of Section 5 was approximately 623 mm, based on the Holbeach station

record (NGR TF440327) located approximately 14 km east of the Section 5 Study Area. This is lower than the Eastern and Northeastern England regional average (1991-2020) of 793 mm.

- 6.5.16 The distribution of rainfall throughout the year varied based on the Holbeach 1991-2020 record. The highest monthly average precipitation was recorded during August (64 mm) followed by October (63 mm). The driest months were March (51 mm) and February (52 mm).
- 6.5.17 Average monthly maximum and minimum temperature estimates for the period of 1991-2020 demonstrate that the summer months (June - August) featured the highest monthly maximum temperatures, and the winter months (December - February) featured the lowest monthly minimum temperatures. The temperature profile is consistent with the range to be expected for the East of England.
- 6.5.18 Across the Eastern and Northeastern England districts, there has been minimal increase in annual rainfall between 1991-2020. The average annual maximum temperatures and average annual minimum temperatures both exhibit an increasing trend for the same period.

### **Topography and Land Use**

- 6.5.19 A review of Ordnance Survey (OS) mapping shows the land across the Section 5 Study Area to be generally flat lying on Ordnance Survey (OS) mapping, with only occasional topographic highs of less than 10 m above ordnance datum (AOD). The low-lying nature of the land, as discussed above, is such that frequent surface water features are present across the Section 5 Study Area, including ponds, drains and streams, and the River Welland in the north and west of the Study Area.
- 6.5.20 The land within the Section 5 Study Area is primarily used for agricultural purposes. There are no major roads crossed by the Refined Siting Zone boundary, with highway infrastructure primarily limited to minor/local roads providing connectivity between agricultural land holdings and the wider A road network (A17, A16 and A151). The existing junction of the A151 is however located within the Study Area to the south of Section 5.
- 6.5.21 No existing properties are located within Section 5, although localised residential properties and farm buildings are present in close proximity. The closest settlement to the Section 5 is Moulton Seas End, approximately 1.4 km to the south east.
- 6.5.22 Existing 400kV overhead lines are present within the Section 5 Study Area, including within the Refined Siting Zone boundary, with one line oriented northwest to southeast and a second northeast to southwest.

### **Hydrology and Surface Water Features**

- 6.5.23 Surface water features identified within the Section 5 Study Area are shown in **PEI Report Volume 2 Part B Section 5 Figure 6.1 Water Environment Receptors and Study Area** and includes two main rivers (River Welland and River Glen) and a network of ordinary watercourses and IDB-maintained watercourses. The IDB-maintained and ordinary watercourses fall within the Welland and Deepings IDB to the west of the River Welland and the South Holland IDB to the east as shown in **PEI Report Volume 2 Part B Section 5 Figure 6.2 Principal Local Water Environment Regulators**. The Section 5 Study Area is located within the Anglian River Basin District (RBD).

- 6.5.24 The River Welland and River Glen predominantly lie to the west of Section 5. A 500 m stretch of the River Glen flows north east and is located within the Study Area which then converges with the River Welland. The River Welland bisects a section of the Refined Siting Zone at the northern extent of the Section 5 Study Area. This main river flows in a northeasterly direction towards the Wash and is tidally influenced across the reach located within the Study Area. As a result, engagement with the Marine Management Organisation (MMO) has identified that a Marine Licence will be required for the overhead line crossing of the River Welland.
- 6.5.25 South Holland IDB comprises many hydrological catchments. Section 5 is within the 'R' catchment, which includes Lord's North and Lord's South (CMT208P) (Ref 32).
- 6.5.26 The Lord's North and Lord's South catchments include IDB-maintained watercourses such as Wykeham Drain (DRN208P1703), Crowtree Connection (DRN208P2001), New Drain (DRN208P1101) and Domino Drainium (DRN208P0502). These drain to the IDB arterial watercourse named Lord's Drain (DRN208P0701). However, under the WFD classifications Lord's Drain is known as Moulton River and is classified as a blue line watercourse. The IDB drainage network conveys flows to the River Welland (Main River) via several water level control structures. The nearest water control structures to the Refined Siting Zone are Lord's Drain Pumping Station and Lord's Drain Sluice (NGR TF295307).
- 6.5.27 The Welland and Deepings IDB is split into 19 smaller catchments (Ref 33), two of which traverse the Section 5 Study Area west of the River Welland. These two catchments are named the Surfleet Catchment and Bluegowt Outfall Catchment.
- 6.5.28 The Surfleet Catchment is situated north of the River Glen and comprises three IDB-maintained watercourses that all discharge in an easterly direction to the River Welland via the Surfleet Marsh Pumping Station (NGR TF284298). The Bluegowt Outfall Catchment is located south of the River Glen and west of the River Welland. The catchment comprises two IDB-maintained watercourses. Blue Gowt Drain discharges to the River Glen while Vernatt's Drain discharges to the River Welland via a pumping station.
- 6.5.29 **Table 6.4** summarises the receptors considered in the preliminary assessment. The value of each receptor has been determined in accordance with **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information** and **PEI Report Volume 3 Part A Appendix 4B EIA Assessment Methodologies and Scope**.

**Table 6.4** Identified surface water receptors and associated value – aquatic environment receptors

Receptor	Value	Rationale
River Welland WFD Transitional and Coastal Water Body (GB530503100400)	High	River Welland EA main river. A WFD transitional and coastal water body supporting moderate status in the Cycle 3 classifications. Supports The Wash SSSI downstream. No licenced abstractions.

Receptor	Value	Rationale
		It is currently assumed one new temporary single span bridge will cross the River Welland. Location to be determined.
Risegate Eau WFD River Water Body (GB205031055525)	High	<p>A WFD river water body supporting poor status in the Cycle 3 classifications.</p> <p>The WFD catchment intersects the Study Area although the 'blue line' watercourse is located outside of the Study Area. Therefore, any effects on the 'blue line' watercourse are considered negligible.</p> <p>Supports the Wash SSSI downstream.</p> <p>No licenced abstractions.</p>
Whaplode River WFD Water Body (GB205031055495)	High	<p>A WFD river water body supporting moderate status in the Cycle 3 classifications.</p> <p>The WFD catchment intersects the Study Area although the 'blue line' watercourse is located outside of the Study Area. Therefore, any effects on the 'blue line' watercourse are considered negligible.</p> <p>No licenced abstractions.</p>
Moulton River WFD River Water Body (GB205031050755)	High	<p>A WFD river water body supporting moderate status in the Cycle 3 classifications.</p> <p>The WFD 'blue-line' watercourse is within the Refined Siting Zone.</p> <p>A South Holland IDB-maintained drain known as Lord's Drain (DRN208P0701).</p> <p>Supports the Wash SSSI 7.3km downstream.</p>
Vernatt's Drain WFD River Water Body (GB205031050705)	High	<p>A WFD river water body supporting moderate status in the Cycle 3 classifications.</p> <p>The WFD 'blue-line' watercourse is located within the western extent of the Study Area outside the Refined Siting Zone.</p> <p>A Welland and Deepings IDB-maintained drain (Vernatts Drain-222).</p>
Glen WFD River Water Body (GB105031050720)	High	<p>A WFD river water body supporting moderate status in the Cycle 3 classifications.</p> <p>The WFD 'blue-line' watercourse is located within the western extent of the Study Area outside the Refined Siting Zone.</p> <p>Intersected by the Section 5 Study Area to the west of the River Welland.</p>
IDB maintained watercourses	Medium	A network of IDB-maintained watercourses managed by Welland and Deepings IDB and South Holland District IDB to maintain drainage within the

Receptor	Value	Rationale
		<p>respective catchments draining to the River Welland. Artificial or heavily modified morphology.</p> <p>Potential for direct impacts as a result of watercourse crossings and diversions. Potential for indirect impacts via changes to runoff rates and water quality as a result of construction activities and the substation(s) operation.</p>
Ordinary watercourses*	Low	<p>Network of heavily modified or artificial drainage channels mainly in the form of field drains along arable field boundaries. Tributary drains to the IDB-maintained, arterial network.</p> <p>Potential for direct impacts as a result of watercourse crossings and diversions. Potential for indirect impacts via changes to runoff rates and water quality as a result of construction activities and the substation(s) operation.</p>

\*Not recorded under any other designations

6.5.30 There are no EA gauging stations on any of the watercourses traversing the Section 5 Study Area. Given that this area is located in an IDB-managed pumped catchment, data from nearby flow gauging stations on other watercourses are unlikely to serve as a useful proxy for the hydrological behaviour of the catchment. Further engagement with South Holland IDB will be carried out prior to finalisation of the ES to ensure that watercourse connectivity and the level management regime in this catchment is fully understood.

### Water Quality and Water Framework Directive Status

6.5.31 The Section 5 Study Area is located within the Anglian RBD, two Operational Catchments and six Water Bodies, as shown in **PEI Report Volume 2 Part B Section 5 Figure 6.4 Water Framework Directive Surface Waterbody Status**.

6.5.32 The WFD classifications for these waterbodies are informed by monitoring a range of parameters that are indicators of water quality from the EA monitoring sites. As **Table 6.5** shows, the waterbodies currently achieve poor to moderate ecological status due to poor nutrient and soil management, sewage discharge, and private sewage treatment and have artificial or heavily modified hydromorphological designations. The waterbodies in Section 5 all have a chemical status of 'fail' due to exceedance of priority hazardous substances, in particular mercury and its compounds, dissolved oxygen, and polybrominated diphenyl ethers (PBDE).

6.5.33 Summary details of the current status for the WFD water bodies relevant to Section 5 are provided in **Table 6.5**, with further detail regarding reasons for not achieving good status (RNAG) and WFD objective provided in **PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Assessment**. Information on groundwater water bodies is included in **PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology**.

Table 6.5 WFD waterbodies in direct connectivity with Section 5

Water Body (ID)	Water Body Type	Water Body Type (Cycle 3)	Overall Water Body status (Cycle 3) (2022) <sup>1</sup>
Risegate Eau Water body (GB205031055525)	River	Artificial	Poor
Vernatt's Drain Water body (GB205031050705)	River	Artificial	Moderate
Welland (GB530503100400)	Transitional Water	Heavily modified	Moderate
Moulton River Water body (GB205031050755)	River	Artificial	Moderate
Whaploade River Water body (GB205031055495)	River	Artificial	Moderate
Glen Water body (GB105031050720)	River	Artificial	Moderate

<sup>1</sup> These are the 2022 statuses as obtained from the Catchment Data Explorer

6.5.34 The Section 5 Study Area is not located within a surface water Drinking Water Protected Area or Safeguard Zone. Most of the Section 5 Study Area is not within Nitrate Vulnerable Zones (NVZs), however the 500 m buffer around Section 5 does transect the Vernatt's Drain NVZ, Glen NVZ, Risegate Eau NVZ and the Whaploade River NVZ.

6.5.35 Information on groundwater Safeguard Zones is included in **PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology**.

#### **Surface Water-Dependent Nature Conservation sites**

6.5.36 Five non-statutory nature conservation sites that are dependent on surface water have been identified within the Section 5 Study Area for Water Environment and Flood Risk. This is shown in **PEI Report Volume 2 Part B Section 5 Figure 4.3 Sites Statutorily designated for their County Biodiversity Importance**, and listed below:

- i. Blue Gowt Drain North Local Wildlife Site (LWS) – Drainage channel that comes off from the River Glen LWS;
- ii. Pinchbeck Marsh LWS;
- iii. Surfleet Seas End Saltmarsh LWS – Area running alongside River Welland that contains coastal and floodplain grazing marsh and mudflats;
- iv. Vernatt's Drain LWS – Drainage channel that runs through arable land close to the River Welland; and
- v. River Glen Corridor LWS – A botanically rich 20 km stretch of the River Glen.

6.5.37 Further detail, including a preliminary assessment of the likely effects of the Project upon these receptors, is provided within **PEI Report Volume 2 Part B Section 5**

**Chapter 4 Ecology and Biodiversity.** Groundwater Dependent Terrestrial Ecosystems (GWDTEs) will be addressed separately in the ES.

**Water Resources**

- 6.5.38 Data to characterise existing water interests has been collected from the EA. Based on the available data within the Section 5, there are four licensed surface water abstractions in the Section 5 Study Area, including:
- i. Licence number 5/31/14/\*S/0264 – located on Lord’s Drain in the north of the Section 5 Study Area downstream of the Refined Siting Zone and is used for trickle irrigation storage by Wragg Marsh Farm (NGR TF299302);
  - ii. Licence number AN/031/0014/062 – located on Lords’s Drain along the eastern edge and downstream of the Refined Siting Zone (NGR TF298271) and utilised by Lamberts Farm for spray irrigation storage;
  - iii. Licence number 5/31/14/\*S/0247 – located on Wykeham Drain in the southwestern region of the Section 5 Study Area upstream and outside the Refined Siting Zone (NGR TF271261). This abstraction is used by Lincolnshire Field Products LTD for spray irrigation storage; and
  - iv. Licence number 5/31/14/\*S/0247 – located on Vernatt’s Drain in the west of the Section 5 Study Area outside the Refined Siting Zone and to the west of the River Welland (NGR TF270270). This abstraction is used by Lincolnshire Field Products LTD for direct spray irrigation.
- 6.5.39 Correspondence with South Holland District Council indicates that there are no private water supplies located within its reaches of the Section 5 Study Area. There are no permitted surface water discharges in the Section 5 Study Area.
- 6.5.40 An assessment of effects upon any identified groundwater abstractions, including private water supplies, is provided in **PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology**.
- 6.5.41 The Welland Abstraction Licensing Strategy (ALS) (Ref 31) indicated that the Section 5 Study Area is located in a restricted water availability area and that is only available for abstraction for on average 98 days per annum (Assessment Point 4, Surfleet).
- 6.5.42 The identified water resource receptors within the Section 5 Study Area and their associated values are listed in **Table 6.6** below.

**Table 6.6 Water resource receptors within the Section 5 Study Area**

<b>Receptor</b>	<b>Value</b>	<b>Rationale</b>
Licensed abstraction from Lord’s Drain at Lamberts Farm, Spalding (AN/031/0014/062)	Low	Within the Refined Siting Zone.  The Lord’s Drain is an IDB arterial watercourse and flows north to discharge to the River Welland via a pumping station (NGR TF295307).
Licensed abstraction from Lord’s Drain for George Hay & Sons LTD	Low	Within the Study Area outside the Refined Siting Zone and downstream of Project infrastructure.



Receptor	Value	Rationale
(5/31/14/*S/0264)		The Lord's Drain is an IDB high priority watercourse and flows north to discharge to the River Welland via a pumping station (NGR TF295307).
Licensed abstraction from Wykeham Drain for Lincolnshire Field Products LTD (5/31/14/*S/0247)	Low	Within the Study Area, however outside and upstream of the Refined Siting Zone.  The Wykeham Drain is an IDB-maintained watercourse and is a tributary to Lord's Drain.
Licensed abstraction from Vernatt's Drain for Lincolnshire Field Products LTD (5/31/14/*S/0247)	Low	Within the Study Area outside of and upstream of the Refined Siting Zone.  Vernatt's Drain is a WFD blue line watercourse and a Welland and Deepings IDB-maintained drain that discharges to the River Welland.

### Flood Risk and Land Drainage

- 6.5.43 The EA's Flood Map for Planning (Ref 24) provides an indication of the likelihood of flooding from fluvial and tidal sources, with Flood Zones 1, 2 and 3 indicating a Low Medium and High (Ref 24) likelihood of flooding respectively. Flood Zone extents are shown on **PEI Report Volume 2 Part B Section 5 Figure 6.1 Water Environment Receptors and Study Area**.
- 6.5.44 According to the EA Flood Map for Planning (Ref 24), the Section 5 Study Area is located within Flood Zone 3 (high risk), equivalent to an annual chance of flooding from rivers and sea of 1 in 200 (0.5%) or greater, with the dominant risk being that of tidal flooding. Section 5 is also situated within three Flood Warning Areas as listed below:
- i. Tidal flooding from the Right Bank of the River Welland near Spalding and Moulton Common (055FWTWELL3);
  - ii. Tidal Welland between Fulney and Fosdyke Bridge (055FWTWELL1); and
  - iii. East of Spalding and surrounding areas (055FWTWELL4B).
- 6.5.45 According to the EA Asset Information and Maintenance (AIMS) database (Ref 32), there are tidal flood defences present in the form of embankments along the banks of the River Welland which are maintained by the EA. The defences provide a design standard of protection of 50 years. The Section 5 Study Area appears to benefit to some level from these defences. However, further work is required to determine the level of the benefit and the potential residual risks associated with defence breach or overtopping. This will determine the type and level of flood protection required for the substation(s).
- 6.5.46 There are a number of areas at risk of surface water flooding within the Section 5 Study Area according to the EA's surface water flood risk mapping (Ref 25) as illustrated in **PEI Report Volume 2 Part B Section 5 Figure 6.3 Surface Water Flood Risk**. Some isolated areas are classified as low, medium and high and are likely associated with small watercourses and localised topographic low points.

- 6.5.47 Risk of flooding from sewers is not considered as a significant source of flooding in Section 5 due to the predominantly rural setting of the Project.
- 6.5.48 The EA's on-line flood risk mapping for reservoirs (Ref 26) indicates no risk of flooding from reservoir failure within the Section 5 Study Area.
- 6.5.49 A number of external receptors for flood risk effects from the Project have been identified within the Section 5 Study Area. The receptors and their associated sensitivity are identified in **Table 6.7**.

**Table 6.7 Identified flood risk receptors and associated sensitivity**

<b>Receptor</b>	<b>Sensitivity</b>	<b>Rationale</b>
Agricultural land and undeveloped land	Low	Water compatible development.
Agricultural premises and commercial property designated as 'Less Vulnerable'	Medium	Less vulnerable development.
Residential properties and other 'Highly Vulnerable' development types and access roads designated as 'More Vulnerable.' This includes properties along Marsh Road, Carrington Road, Hall Gate road and Stone Gate road.	High	More vulnerable development.
Flood defence embankments along the River Welland and other essential infrastructure that is vulnerable to flooding, such as the A151 and A16.	Very High	Essential infrastructure or highly vulnerable development.

## Future Baseline

- 6.5.50 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 can be 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.
- 6.5.51 At this preliminary stage, a full assessment of the implications of any committed 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.

## Climate and Flood Risk

- 6.5.52 Climate change is likely to lead to significant changes in hydrological conditions within the Section 5 Study Area over the lifetime of the Project. Outputs from

UKCP18 (Ref 35) and the Future Flows and Groundwater Levels (FFGWL) Project (Ref 36) will be used to assess likely changes in ambient conditions for the purposes of the future baseline.

- 6.5.53 The FFGWL project is the first of its kind to conduct a consistent assessment of the impact of climate change on river flows and groundwater levels across Great Britain. The project modelled a total of 282 river catchments and 24 boreholes to capture the range of climate, land use, geological and geographical characteristics found in England, Wales and Scotland. The outputs aid the study of the impact of climate change on water availability and allows river basin management plans to be tested for robustness (Ref 37). Analysis of the impact of climate change on transient flows for watercourses traversing the Section 5 Study Area has not been conducted due to the lack of location-specific data. However, an upstream datapoint on the River Chater, a tributary of the River Welland, indicates that transient flows are projected to decrease at all flow percentiles across all models. For the Q30 flow percentile, a decrease of up to 10% by 2080 is predicted by most models. At the Q90 flow percentile, decreases in transient flows range between 60% and 20% by 2080, depending on the model used (Ref 38). Assessment of seasonal average changes in the region of the Section 5 Study Area indicate that in the 2050s winter flows will increase up to 20% in most scenarios, spring flows will decrease by up to 20% in most scenarios, summer flows will decrease by between 20% and 40% in most scenarios and autumn flows will decrease by up to 20% in most scenarios (Ref 39).
- 6.5.54 For the FRA, the impacts of climate change on future flood risk will be assessed in line with current EA guidance (Ref 40). Current EA recommendations for climate change factors to be applied to extreme rainfall and river flows for the Project area and are summarised in **Table 6.8**, **Table 6.9** and **Table 6.10**. These factors are based on analysis of UKCP18 climate model outputs for rainfall and from hydrological models driven by UKCP18 rainfall outputs.

Table 6.8 Peak river flow climate change allowances (Ref 41)

Allowance Category	Potential Change Anticipated for the 2020s	Potential Change Anticipated for the 2050s	Potential Change Anticipated for 2080s
<b>Welland Management Catchment</b>			
Upper	22%	26%	53%
Higher	10%	10%	28%
Central	5%	4%	17%

Table 6.9 3.3 per cent Annual Exceedance Probability (AEP) peak rainfall climate change allowances (Ref 41)

Allowance Category	Potential Change Anticipated for the 2050s	Potential Change Anticipated for the 2070s
<b>Welland Management Catchment</b>		
Upper	35%	35%
Central	20%	25%

Table 6.10 1 per cent AEP peak rainfall climate change allowances (Ref 41)

Allowance Category	Potential Change Anticipated for the 2050s	Potential Change Anticipated for the 2070s
<b>Welland Management Catchment</b>		
Upper	40%	40%
Central	20%	25%

6.5.55 Net sea level rise in northern England will be lower than in the south due to glacial isostatic adjustment<sup>1</sup>, which causes the northern parts of the UK to rise slowly. In the Humber region, net sea level rise from the year 2000 is projected to increase by 1.15 m to 1.55 m by 2125, based on higher central and upper end allowances (Ref 40). In the Anglian region, net sea level rise from the year 2000 is expected to increase by 1.20 m to 1.60 m by 2125, according to the same allowances (Ref 40).

### Topography and Land Use

6.5.56 Land use change can affect the permeability of the ground, which can affect surface water run-off. Given that most of the Section 5 Study Area is comprised of agricultural land outside of established settlement boundaries, it is unlikely that the run-off regime will change significantly within and surrounding the Study Area. However, as noted above, the Section 5 Study Area is within an IDB-managed pumped catchment. Changes to agricultural land use practices and rising tidal levels in the River Welland resulting from climate change may impact the management arrangements for this catchment in the future. Given that the surrounding areas are largely rural and in Flood Zone 3, significant new urban development pressure is unlikely. Nevertheless, developers of any new commercial or residential development will be obliged to meet

<sup>1</sup> **Glacial Isostatic Adjustment (GIA):** During the last Ice Age, massive ice sheets covered much of northern Europe, including parts of the UK. The weight of these ice sheets caused the Earth's crust to depress.

1. **Post-Glacial Rebound:** After the ice sheets melted, the crust began to slowly rebound or rise. This process is still ongoing today. In northern England, the land is rising more significantly due to this rebound effect.
2. **Relative Sea Level Changes:** Because the land in northern England is rising, the relative sea level rise is lower compared to the south. In southern England, the land is not rising as much, and in some areas, it might even be subsiding slightly. This makes the relative sea level rise appear higher in the south.

This difference in land movement due to GIA is why you see varying rates of sea level rise across different parts of the UK.

the requirements of the NPPF to ensure that surface runoff is managed within developments so as not to increase flood risk to others.

### **Water Quality and Water Framework Directive Status**

- 6.5.57 Given the current status of the WFD waterbodies within the Section 5 Study Area is moderate or poor, it is anticipated the future status will improve, ultimately to good, as required by the WFD. Improvements to WFD water body status associated with improvements to individual quality elements (i.e., PBDE) would result in higher-quality, aquatic environments in these waterbodies. Given that the sensitivity of WFD waterbodies is not determined by their status, this does not influence the assessment relative to the existing or future baseline.
- 6.5.58 The WFD reasons for not achieving good status for waterbodies within the Study Area are included in **PEI Report Volume 3 Part C Route-wide Appendix 5B Preliminary Water Framework Directive Assessment**.

### **Water Resources**

- 6.5.59 The location and rate of surface water abstractions in the area could vary over time and may result in changes to ALS water availability. The Welland ALS has restricted water availability for new abstractions in the region of the Section 5 Study Area. Any new licences would be subject to volume, hands-off flow and/or minimum residual flow restrictions to ensure sufficient flow remained for environmental support purposes.

## **6.6 Design, Control and Additional Mitigation Measures**

### **Design Mitigation Measures**

- 6.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 43) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 44) 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 45) 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.
- 6.6.2 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routeing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.
- 6.6.3 In Section 5 such measures are anticipated to include refinement of the Refined Siting Zone boundary to avoid sensitive Water Environment and Flood Risk receptors, where practicable, which is also consistent with the sequential approach to management of flood risk advocated in NPS EN-1 (Ref 46); and NPPF (Ref 9).

Additionally, it is assumed that the following measures will be embedded within the Section 5 design:

- i. Any flood protection measures for the substation(s) are to be designed in accordance with National Grid internal guidance and consistent with planning policy requirements to ensure no increased flood risk to third parties;
- ii. Substation surface water drainage systems will provide attenuation of runoff from impermeable surfaces to greenfield rates and incorporate appropriate pollution prevention measures, incorporating the use of Sustainable Urban Drainage Systems (SuDS) as far as practicable;
- iii. If watercourse diversions are required to provide sufficient space for the substation platforms, then these will be designed to provide an equivalent conveyance capacity to the existing watercourses and will incorporate morphological features to promote aquatic biodiversity to a level that is consistent with maintaining effective land drainage. Culverting will be avoided as far as practicable; and
- iv. Any requirements for water supply and foul water treatment and disposal for office and welfare facilities at substation(s) will be designed to minimise impacts on water resources and receiving water quality.

6.6.4 The preliminary assessment of effects presented herein assumes that the embedded design mitigation set out above will be implemented. The specific details of these measures will be developed for the ES for the DCO application.

## Control Mitigation Measures

### Construction

6.6.5 A Preliminary Code of Construction Practice (CoCP) is provided in **PEI Report Volume 3 Part A Appendix Preliminary Code of Construction Practice**. General aspects of the control measures pertinent to Water Environment and Flood Risk include:

- i. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerks of Works (EnvCoW) 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.
- ii. 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.
- i. GG05: A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.
  - ii. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Site Waste Management Plan (SWMP) and a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Plan (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), 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. GG15: Fuels, oils and chemicals will be stored responsibly, away from sensitive water receptors. Where practicable, they will be stored >15 m from watercourses, ponds and groundwater dependent terrestrial ecosystems. Where it is not practicable to maintain a >15 m distance, additional measures will be identified. All refuelling, oiling and greasing of construction plant and equipment will take place above drip trays or other suitable controls and also away from drains as far as is reasonably practicable. Vehicles and plant will not be left unattended during refuelling. Appropriate spill kits will be made easily accessible for these activities. Potentially hazardous materials used during construction will be safely and securely stored including use of secondary containment where appropriate. Stored flammable liquids such as diesel will be protected either by double walled tanks or stored in a bunded area with a capacity of 110% of the maximum stored volume. Spill kits will be located nearby.
  - v. GG16: Runoff across the site will be controlled through a variety of methods including header drains, buffer zones around watercourses, on-site ditches, silt traps and bunding. There will be no intentional discharge of site runoff to ditches, watercourses, drains or sewers without appropriate treatment and agreement of the appropriate authority (except in the case of an emergency).

- vi. GG17: Wash down of vehicles and equipment will take place in designated areas within construction compounds. Wash water will be prevented from passing untreated into watercourses and groundwater. Appropriate measures will include use of sediment traps, daily checks and ongoing monitoring.
- vii. GG23: Stone pads or similar will be installed in areas where heavy equipment, such as cranes and piling rigs, are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of the topsoil, which will be stored and reinstated in accordance with the Soil Management Plan.

6.6.6 The control and management measures included within this document specific to the Water Environment and Flood Risk include:

- i. W01: All works affecting watercourses or within the relevant permitting stand-off distance from the top of bank or landward toe of a flood defence on main rivers and IDB maintained watercourses will be in accordance with a method approved under consents issued under the Environmental Permitting Regulations 2016, Land Drainage Act 1991, IDB Byelaws (where relevant) or the protective provisions of the DCO for the benefit of the EA, LLFAs and IDBs . Where possible, a stand-off distance from the top of bank of all watercourses/waterbodies will be established (with the exception of crossings and where existing field access roads are already located adjacent to watercourses are to be utilised). To align with EA and IDB consenting requirements, it is proposed that this will be: 16 m for tidal main rivers; 8 m for non-tidal main rivers; and 9 m for IDB-maintained watercourses. No statutory stand-off distances are specified for ordinary watercourses, but any works liable to cause an obstruction to flow would be subject to consent under the Land Drainage Act 1991. Appropriate stand-off distances should also be implemented where Project construction activities coincide with water supply and sewerage infrastructure. These are to be agreed on a case-by-case basis. For any instances where the stand-off distances stated above cannot be achieved between construction works and watercourses, these works would be subject to the appropriate consent by the relevant drainage authority (Flood Risk Activity Permit (FRAP) for main rivers, Ordinary Watercourse Consent (OWC) for ordinary watercourses).
- ii. W02: For open cut watercourse crossings and installation/ removal of vehicle crossing points, good practice measures will include but not be limited to, where practicable:
  - reducing the working width for open cut crossings of a main or ordinary watercourse whilst still providing safe working;
  - installation of a pollution boom downstream of open cut works;
  - the use and maintenance of temporary lagoons, tanks, bunds, silt fences or silt screens as required;
  - have spill kits and straw bales readily available at all crossing points for downstream emergency use in the event of a pollution incident;
  - the use of all static plant such as pumps in appropriately sized spill trays;
  - prevent refuelling of any plant or vehicle within 15 m of a watercourse;
  - prevent storing of soil stockpiles within 15 m of a main river;



- inspect all plant prior to work adjacent to watercourses for leaks of fuel or hydraulic fluids; and
  - reinstating the riparian vegetation and natural bed of the watercourse, using the material removed when appropriate, on completion of the works and compacting as necessary. If additional material is required, appropriately sized material of similar composition will be used.
- iii. W03: Riverbank and in-channel vegetation will be retained where not directly affected by installation works. As far as possible, natural substrate will be provided through temporary watercourse crossing culverts.
  - iv. W04: Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary clear span bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and construction mats placed over the backfilled area to permit the passage of plant, equipment, materials, and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge. Where flood defences are present, crossing design should ensure that their integrity and standard of protection are preserved. Watercourse bed, banks and any flood defences will be subject to full reinstatement on removal of temporary watercourse crossings on completion of construction works. Specific detailed designs for each watercourse crossing, consistent with these design principles, will be prepared by the construction contractor. These will be subject to the appropriate consent by the relevant drainage authority (FRAP from the Environment Agency for main rivers; OWC from the LLFA or IDB for ordinary watercourses).
  - v. W05: The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard not only to volumes and discharge rates, but also to water quality (particularly suspended solids, pH and hydrocarbons) and will include discharges to land, water bodies or third-party drains/sewers.
  - vi. W06: The Project will incorporate appropriate surface water drainage measures into its final design for the haul roads, access tracks, works compounds and laydown areas so that they do not lead to a significant increase in flood risk. Access roads (and working areas) in the floodplain are to be as close to ground level as possible (a slight raised surface, relative to the adjacent land, is often required to allow for drainage). This is to minimise the loss of floodplain storage volumes associated with raised structures such as raised access roads, working areas and associated topsoil stockpiles. Cross drainage would be provided as necessary at topographic low points. Stockpiles would be located outside of the floodplain as far as reasonably practicable. Approaches to bridges and culverts in Flood Zones would minimise ramping up to the bridge deck so as not to impede flood flow conveyance.
  - vii. W07: The contractor(s) will subscribe to the EA's Floodline service, which provides advance warning of potential local flooding events, and subscribe to the Met Office's Weather Warnings email alerts system and any other relevant flood warning information. The contractor(s) will implement a suitable flood risk action

- plan, which would form part of the Emergency Action Plan, and will include appropriate evacuation procedures should a flood occur or be forecast.
- viii. W08: Active private water supplies will be identified with landowners through the landowner discussions. Appropriate measures would be considered during construction to prevent any water quality deterioration from pollution. In the event of a landowner or tenant reporting that installation activities have affected their private water supplies, an initial response will be provided within 24 hours. Where the installation works have affected a private water supply, an alternative water supply will be provided, as appropriate.
  - ix. W09: In the event of a significant spill during construction, all relevant landowners/tenants will be contacted within 24 hours, within 250 m of the spill, to determine if there are any private water supplies that might be affected; an assessment of the likelihood of groundwater contamination reaching identified private water supplies will be undertaken, and where a private water supply is judged likely to be affected, an alternative water supply will be provided, as appropriate.
  - x. W10: Severance of existing land drainage routes, including agricultural field drainage systems would be managed during construction through provision of temporary alternative drainage routes, and these drainage systems would be permanently reinstated to ensure their existing function is maintained.
  - xi. W11: Appropriate control of runoff from working areas will be achieved through implementation of a DrMP for the construction phase. The DrMP will use sustainable urban drainage systems (SuDS) principles, promoting infiltration of runoff wherever possible and specifying appropriate treatment and attenuation storage to ensure any discharges to watercourses are uncontaminated and limited to greenfield rates. The DrMP will cover all aspects of construction works and temporary infrastructure. Drainage measures will be phased to be completed before the commencement of earthwork operations, in a specific area, and will be retained until the drainage system of the completed Project is fully operational, or site restoration works are completed. This will include the temporary diversion of existing agricultural drainage around working areas, if required, followed by reinstatement on completion of works. At this stage of the design process, preliminary work has already been done to identify runoff treatment and attenuation requirements for temporary access tracks and working areas associated with overhead line construction, including defining potential locations of water treatment areas and discharge outfalls. Further work is required to develop drainage strategies for substations, considering arrangements for both construction and operational phases of the Project, which will be reported as part of the ES chapter and FWRA in submission with the DCO application).

## Additional Mitigation Measures

- 6.6.1 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.
- 6.6.2 Based upon the preliminary assessment, additional mitigation measures are not anticipated to be required in relation to Water Environment and Flood Risk effects.

However, this will remain under review during the completion of further assessment and development of the ES.

## 6.7 Preliminary Assessment of Effects

- 6.7.1 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 within Section 5.
- 6.7.2 The preliminary assessment of effects reported below take into account the Design and Control measures, as previously described.
- 6.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 6.11**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 6.7.4 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

#### Aquatic Environment and Water Resources Receptors

- 6.7.5 Based upon the preliminary assessment, no significant effects are predicted for aquatic environment and water resource receptors within Section 5 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.

### Flood Risk

#### Changes to Fluvial Flood Risk Associated With Loss of Floodplain Storage and/or Change in Floodplain Flow Conveyance

- 6.7.6 The land within the Section 5 is predominantly within Flood Zone 3, with pockets of Flood Zone 2 and 1 in the centre of the Refined Siting Zone. The construction of infrastructure within this zone has potential to reduce or displace floodplain storage, which could adversely impact flood risk. It is assumed, temporary works would include stockpiling of materials within the floodplain, due to both the temporary storage of soils and the import of aggregate for the design elements. The construction of access routes, presence of stockpiles, watercourse crossings and working areas also has the potential to compartmentalise the floodplain by obstructing water flow.
- 6.7.7 The area within Section 5 is defended floodplain. Therefore, under normal conditions, there would be no effect on floodplain storage and conveyance arising from project construction activities. However, under conditions of flood defence overtopping or breach, the presence of the Project construction works could lead to a change in

residual flood risk for external receptors, through reducing floodplain storage or impeding flood conveyance.

- 6.7.8 The potential for loss of the floodplain and changes in floodplain flow conveyance would be managed through embedded control measures, including ensuring that temporary access watercourse crossings have sufficient conveyance capacity (Preliminary CoCP Measure W04), ensuring that access roads and working areas in the floodplain are as close to ground level as possible (W06) and that appropriate provision for disruption of drainage is provided (W10). It should also be noted that construction activities are temporary, temporary works infrastructure would be removed and the affected land and watercourses which are not permanently affected by the Project would be fully reinstated following completion.
- 6.7.9 A full assessment of potential changes in flood risk to external third party receptors has not yet been completed. There are several factors which require further assessment to inform the final FRA and ES, informed by engagement with the EA. Specifically these include confirmation of the standard of defence provided by the existing system of flood risk management assets; confirmation of compensatory storage requirements; review existing flood models and agreement of the scope of future assessment to be reported within the FRA and ES. Further information has been provided in the **PEI Report Volume 3 Part C Route-wide Appendix 5A Preliminary Flood Risk Assessment**.
- 6.7.10 Notwithstanding the application of embedded measures, the magnitude of impacts upon flood risk due to potential loss of floodplain storage and/or change in floodplain flow conveyance is precautionarily assessed as medium adverse, given the large scale of the proposed works at Weston Marsh. Based upon the receptor sensitivities of essential infrastructure (very high), residential infrastructure (high), commercial infrastructure and local roads (medium), and agricultural land and undeveloped land (low), associated effects on flood risk receptors during the construction phase are assessed as minor to major adverse with the moderate or greater effects classed as significant.

## **Operation and Maintenance**

### **Aquatic Environment and Water Resources Receptors**

- 6.7.11 The operational phase impacts on aquatic environment and water resource receptors arising from overhead line aspects of the project were scoped out of the assessment at scoping stage and are therefore not considered further, in accordance with the Scoping Opinion.
- 6.7.12 Based upon the preliminary assessment, no significant effects are predicted upon aquatic environment and water resource receptors within the Section 5 Study Area, as a result of the operation and maintenance of the substation(s). Further discussion is provided in the following sections in relation to the predicted non-significant effects of the Project.

## Flood Risk

### Changes to Fluvial Flood Risk Associated With Loss of Floodplain Storage and/or Change in Floodplain Flow Conveyance

- 6.7.13 The effects on flood risk receptors from the operation of the Project have been scoped into the assessment for the substation(s) and pylons in Section 5. As noted above, the Project infrastructure within Section 5 is within an area of defended floodplain. Therefore, under normal conditions, there would be no effect on floodplain storage and conveyance arising from the project. However, under conditions of flood defence overtopping or breach, the presence of the Project infrastructure could lead to a change in residual flood risk for external receptors through reducing floodplain storage or impeding flood conveyance.
- 6.7.14 Due to their open lattice structure, the impact on floodplain storage resulting from the presence of pylons is considered to be negligible, even under conditions where flood defences are overwhelmed. Regarding impacts on flow conveyance, this too is likely to be negligible, except under circumstances where pylons are located close to flood defence breach or overtopping. This will be considered further as part of modelling assessments being carried out to support the DCO FRA.
- 6.7.15 In relation to substation(s), National Grid design criteria (Ref 46) requires substations to be resilient to flooding up to and including a 1 in 1,000-year (0.1% AEP) flood event with an allowance for climate change. To ensure the substation(s) achieve the required flood resilience there may be a requirement for land raising in the area, or the construction of a flood defence wall or embankment to provide resilience to the substation(s) and associated accesses.
- 6.7.16 The current standard of protection of all current defences needs to be assessed to ensure defences are accurately represented in any modelling required. Correspondence from the EA (received 04 February 2025) indicates that local flood storage compensation may be required as Section 5 lies within a defended tidal zone. This is to offset the displaced flood water for 1% AEP fluvial event plus climate change and 0.5% AEP tidal event plus climate change. There may be increased residual risk of flooding under the circumstances of breach or overtopping at this location if a substation(s) platform level is raised behind defences and associated additional mitigation is not in place. The permanent impacts of the substation(s) upon flood risk are, however, subject to further design development and ongoing flood risk assessment.
- 6.7.17 Further investigations are required and consultations with the EA to understand the flood risk in the Study Area, review of existing flood models and define the scope of the assessment to be reported in the FRA and ES. This will include an assessment of the effects of climate change over the lifetime of the Project.
- 6.7.18 At this preliminary stage of assessment, the magnitude of impacts upon flood risk due to permanent loss of floodplain storage capacity is assessed as large adverse, given current uncertainty around magnitude of impacts and requirements for additional mitigation. In the absence of additional mitigation, effects upon flood risk receptors during the operational phase are likely to be major to moderate, and therefore significant.

## Non-Significant Effects

- 6.7.19 For completeness, **Table 6.11** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Water Environment and Flood Risk effects.

Table 6.11 Preliminary summary of non-significant Water Environment and Flood Risk effects – Section 5

Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
<b>Construction Phase</b>					
<b>Aquatic Environment Receptors</b>					
Deterioration in the water quality of aquatic environment receptors via generation of sediment laden run-off as a result of construction activities, e.g. watercourse crossings and excavations	WFD river and transitional waterbodies (referred to in <b>Table 6.4</b> and <b>Table 6.5</b> )	High	Negligible	Not significant (negligible)	During the construction phase of the new pylons and up to two new substation(s) there is potential to generate sediment laden runoff which could, in absence of any appropriate embedded measures, adversely affect water quality in surface water receptors. Activities that could potentially produce sediment-laden runoff include:
	IDB-maintained watercourses and ordinary watercourses (referred to in <b>Table 6.4</b> )	Low - Medium	Small Adverse	Not significant (minor)	<ul style="list-style-type: none"> <li>• Construction and removal of access routes, construction compounds and working areas (including topsoil stripping, earthworks and excavations);</li> <li>• Runoff from installed access routes, temporary construction compounds and working areas;</li> <li>• Direct sediment disturbance from in channel works for the construction of access crossings;</li> <li>• Potential diversion/realignment of ordinary watercourses and IDB watercourses; and</li> <li>• The use and management of soil stockpiles.</li> </ul> <p>The assessment of suspended sediment-related effects is considered precautionary, given that the watercourses across the</p>

Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
					<p>Section 5 Study Area are likely to experience baseline variation in suspended sediment due to agricultural practice in the area.</p> <p>Embedded environmental measures outlined in the Preliminary CoCP (GG03, GG16, W01, W05 and W11) would render effects on the watercourses as not significant.</p>
<p>Potential impacts on hydromorphology and flow conveyance as a result of increased sediment inputs from watercourse disturbance (including from new watercourse crossings).</p>	<p>WFD river and transitional waterbodies (referred to in <b>Table 6.4</b> and <b>Table 6.5</b>)</p>	<p>High</p>	<p>Negligible</p>	<p>Not significant (negligible)</p>	<p>Works directly affecting watercourses, such as crossings and diversions, could result in a direct impact on their hydromorphology. The direct impacts would be mitigated to an extent with the implementation of the measures set out within the Preliminary CoCP. This includes W01, W02 and W04. As a result, effects are not significant.</p>
	<p>IDB-maintained watercourses and ordinary watercourses (referred to in <b>Table 6.4</b>)</p>	<p>Low - Medium</p>	<p>Small Adverse</p>	<p>Not Significant (Minor)</p>	<p>It is assumed there would be a crossing of the River Welland with a haul road. Where there is a requirement to undertake works in and around the watercourses, including installation of access crossings (assumed to be culverts for most watercourses), the footprint of these would be kept to a minimum and ensure minimum change to existing morphology and flow conveyance, by adhering to embedded environmental measure W02.</p> <p>Excess sediment ingress via runoff from working areas could indirectly influence these characteristics, for example due to a</p>



Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
					<p>subsequent build-up of sediment within the channel.</p> <p>Any potential increases in sediment-laden runoff from working areas would be mitigated using the embedded environmental measures outlined in the Preliminary CoCP (GG03, GG16, W01, W05 and W11). As a result, effects are not significant.</p>
<p>Deterioration in the water quality of aquatic environment receptors affected by mobilisation of contaminants from contaminated soil or accidental spillage of pollutants (e.g fuel or oil).</p>	<p>WFD river and transitional waterbodies (referred to in <b>Table 6.4</b> and <b>Table 6.5</b>)</p>	<p>High</p>	<p>Negligible</p>	<p>Not significant (negligible)</p>	<p>The construction works have the potential to affect water quality conditions within surface water features via:</p> <ul style="list-style-type: none"> <li>• accidental spillage of fuel, oil, concrete or other chemicals used during construction;</li> <li>• mobilisation/leaching of contaminants from historical soil contamination during excavation works; and</li> <li>• contaminated water pumped from excavations.</li> </ul>
	<p>IDB-maintained watercourses and ordinary watercourses (referred to in <b>Table 6.4</b>)</p>	<p>Low - Medium</p>	<p>Small Adverse</p>	<p>Not significant (minor)</p>	<p>The implementation of the embedded measures outlined in the Preliminary CoCP (GG03, GG15, GG23, W02, W05, W09 and W11) designed to prevent surface water pollution (for example implementation of good working practices with adherence to the Outline CoCP) would ensure the effect on surface water receptors and water resources/WFD receptors is not significant.</p>

Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
Deterioration in the water quality of aquatic environment receptors affected by mobilisation of contaminants in groundwater and subsequently surface water	WFD river and transitional waterbodies (referred to in <b>Table 6.4</b> and <b>Table 6.5</b> )	High	Negligible	Not significant (negligible)	The risk of pollution of groundwater as a result of Project construction activities would be controlled through preparation of a Foundation Works Risk Assessment (FWRA, Control Measure GH02 - <b>PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology</b> ) for piling and excavation works. This would specify the use of suitable piling methods to prevent the creation of pathways for vertical groundwater movement between superficial and deeper aquifers.
	IDB-maintained watercourses and ordinary watercourses (referred to in <b>Table 6.4</b> )	Low - Medium	Small Adverse	Not significant (minor)	Therefore, in this preliminary assessment, effects upon surface water receptors resulting from the mobilisation of ground contaminants are not significant.
Impact from any dewatering for construction from temporary works impacting groundwater – surface water interactions.	WFD river and transitional waterbodies (referred to in <b>Table 6.4</b> and <b>Table 6.5</b> )	High	Negligible	Not significant (negligible)	Any discharge of water generated during construction (e.g. from pylon foundation excavations) to land would be of unpolluted water only and undertaken in accordance with control measure W05 within the Preliminary CoCP.
	IDB-maintained watercourses and ordinary watercourses (referred to in <b>Table 6.4</b> )	Low - Medium	Small Adverse	Not significant (minor)	The superficial deposits within the Study Area are designated as unproductive strata. There is a lack of groundwater level information within the superficial deposits within the Study Area. In a worst-case scenario, the Tidal Flat deposits may have consistent shallow groundwater across the Study Area and limited groundwater control/pumping may be required for construction within the

Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
					<p>superficial deposits. It is assumed dewatering within the superficial deposits would be required to facilitate construction and not within the bedrock, so there would be no requirement for dewatering of the bedrock aquifers and therefore, no significant effects.</p> <p>Where dewatering is required, temporary measures would be undertaken in accordance with EA guidance and in line with control measures. Groundwater effects on flows and levels are predicted to be limited and as a result, there is a limited scope for groundwater dependent surface water flows to be affected.</p> <p>For mobilisation of pre-existing contamination, control measures proposed in <b>PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology</b> would be implemented. It is likely that these control measures would protect surface water.</p> <p>Therefore, predicted effects due to dewatering of temporary works areas are not significant.</p>
<b>Water Resource Receptors</b>					
The potential effects noted above for surface water aquatic environment receptors could also have implications	Licensed surface water abstractions	Low	Negligible	Not significant (negligible)	Four surface water abstractions were identified within the Refined Siting Zone. Any effects on the abstraction or discharge infrastructure and any indirect effects on flow

Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
for surface water resource availability.	(referred to in <b>Table 6.6</b> )				<p>or quality in receiving watercourses as a result of the construction of the Project would not affect the ability of the abstraction to operate as consented.</p> <p>Indirect effects on the quantity and quality of water available for abstraction downstream of the Refined Siting Zone would be controlled by control measures secured via the CEMP.</p> <p>It is therefore concluded that predicted effects on water resource receptors within the Section 5 Study Area are not significant.</p>

#### Flood Risk Receptors

Changes to surface water flood risk due to changes in runoff rates resulting from ground disturbance and creation of impermeable surfaces, and to changes in surface water runoff pathways due to changes in ground surface levels.	Property and Infrastructure at risk of flooding (referred to in <b>Table 6.7</b> )	Low – Very High	Negligible	Not significant (negligible to minor)	<p>It is anticipated that during construction, there may be temporary changes to land surface permeabilities. Temporary surfaces with lower permeability relative to the baseline include stone aggregate surfaces on the following: haul roads, pylon working areas, construction compounds and laydown areas. It is assumed Type 1 aggregate would be used, which has a lower permeability than the soils present across the majority of the Study Area. However, this finish is not as impermeable as tarmac or concrete.</p> <p>Changes to surfacing resulting from temporary works could reduce rainfall infiltration rates, increase runoff rates, and induce overland flow during construction. This could contribute to localised changes to the</p>
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Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
<p>Changes to watercourse flow conveyance arising from the presence of new or modified temporary watercourse crossings increasing the risk of flooding to flood risk receptors.</p>	<p>Property and Infrastructure at risk of flooding (referred to in <b>Table 6.7</b>)</p>	<p>Low – Very High</p>	<p>Negligible</p>	<p>Not significant (negligible to minor)</p>	<p>land drainage regime, resulting in ponding of water or waterlogging of soils. Areas with a sloping topography where topsoil has been stripped would be particularly vulnerable to these changes. Any potential watercourse diversions may also disrupt or sever existing field drainage systems, dependent on the alignment of any diversions. The design of Section 5 remains in development with the above aspects anticipated.</p> <p>The proposed embedded measures to prevent an increase in surface water flood risk during construction are set out in the Preliminary CoCP, and include W06 and W10.</p> <p>Based upon the implementation of these embedded measures, effects on flood risk receptors due to changes in run-off rates and pathways during the construction phase are predicted to be negligible to minor adverse, and therefore not significant.</p> <p>It is assumed that there would be temporary watercourse crossings proposed within the Refined Siting Zone. In the absence of appropriate measures, these crossings could impact flow conveyance, which could potentially influence flood risk upstream of the watercourse crossing.</p> <p>The proposed embedded measures to prevent an increase in surface water flood</p>

Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
					<p>risk due to changes in existing watercourse flow conveyance are set out in the Preliminary CoCP and include W04 and W10.</p> <p>Based upon the implementation of these measures, predicted effects upon flood risk due to new or temporary watercourse crossing are not significant.</p>
<p>Impacts on the integrity of flood defence and land drainage infrastructure as a result of physical impingement of Project infrastructure.</p>	<p>Property and Infrastructure at risk of flooding (referred to in <b>Table 6.7</b>)</p>	<p>Low – Very High</p>	<p>Negligible</p>	<p>Not significant (negligible to minor)</p>	<p>In the absence of appropriate measures, the impingement of Project infrastructure could deteriorate the factor of safety of flood defences, which could potentially increase flood risk to downstream receptors.</p> <p>Project infrastructure would only impact watercourses which have flood defence embankments present such as the River Welland. The Section 5 Study Area is defended floodplain, therefore, protects for events up to the standard of protection.</p> <p>The proposed embedded measures to maintain the integrity of the flood defence during construction are set out in the draft Outline CoCP and include W04. Generally, a hierarchy of mitigation principles would be as follows:</p> <ul style="list-style-type: none"> <li>• Avoid where possible</li> <li>• Pre-commencement survey</li> </ul>

Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
					<ul style="list-style-type: none"> <li>Minimise invasive works to the flood defence through bridging or placing of additional material</li> <li>Ensure any crossings are designed to bear design loads to avoid compaction settlement of the flood defence</li> <li>Ensure full restoration of flood defence following completion of works, followed by completion survey.</li> <li>If invasive works are required to a flood defence which would lead to a loss of standard of protection (i.e. through temporary breach or partial removal) design of alternative flood protection, through realignment around works would be required.</li> </ul> <p>Based upon the implementation of embedded measures, effects on flood risk receptors due to impacts upon existing flood defences and drainage infrastructure during the construction phase are predicted to be negligible to minor adverse, and therefore not significant.</p>

## Operation Phase

### Aquatic Environment and Water Resources Receptors

Increased pollution from storage of potential pollutants	WFD river and transitional waterbodies (referred to in <b>Table 6.4</b> and <b>Table 6.5</b> )	High	Negligible	Not significant (negligible)	The substation(s) have the potential to affect water quality conditions and therefore, aquatic environment receptors within the
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Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
such as oil-filled transformers.	IDB-maintained watercourses and ordinary watercourses (referred to in <b>Table 6.4</b> )	Low - Medium	Small adverse	Not significant (minor)	associated water features via the introduction of contaminants.  Substation drainage design would incorporate suitable pollution prevention measures for surface runoff through the use of SuDS, plus containment and oil interceptors for transformers as required. Foul drainage arisings from welfare facilities on the site would either be discharged to the mains sewer network or tankered off site to an appropriate permitted treatment facility. Overhead line maintenance would involve light vehicles using existing agricultural access, and would not involve significant ground disturbance. Therefore, the impacts of the operation of Section 5 on aquatic environment receptors and water resources is considered negligible to minor and not significant.

### Flood Risk Receptors

Changes to surface water flood risk due to changes in runoff rates resulting in the creation of impermeable surfaces, and to changes in surface water runoff pathways due to changes in ground surface levels.	Property and Infrastructure at risk of flooding (referred to in <b>Table 6.7</b> )	Low – Very High	Negligible	Not significant (negligible to minor)	It is assumed no significant increase in permanent impermeable area associated with the foundation elements of pylons within Section 5. Permanent impermeable surfaces are assumed to include tarmac access roads to and within the substation(s) and concrete and/or tarmac hardstanding within the substation(s) boundaries and associated building footprints. The proposed measures for the impermeable surfaces associated with the substation(s) during operation include
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Impact	Receptor	Value of Receptor <sup>1</sup>	Magnitude of Change <sup>2</sup>	Significance <sup>3</sup>	Rationale
					mitigation through drainage design. Given that the design of Section 5 of the Project remains in development, is based upon a precautionary approach.
					Overhead line maintenance is assumed to involve light vehicles using existing agricultural access and not involve significant ground disturbance. Therefore, the impacts of the operation of Section 5 Project infrastructure on flood risk receptors is considered negligible and not significant.

<sup>1</sup> The value of receptor is defined using the criteria set out in Appendix 4B Environmental Impact Assessment Methodologies and Scope and is defined as Low, Medium, High and Very High.

<sup>2</sup> The magnitude of change on a receptor resulting from activities relating to the development is defined using the criteria set out in Appendix 4B Environmental Impact Assessment Methodologies and Scope and is defined as negligible, small, medium, large adverse and beneficial.

<sup>3</sup> The significance of the environmental effects is based on the combination of the value of a receptor and the magnitude of change and is expressed as major (significant), moderate (potentially significant) or minor/negligible (not significant), subject to the evaluation methodology outlined in Appendix 4B Environmental Impact Assessment Methodologies and Scope.

## **6.8 Monitoring**

- 6.8.1 Given that significant effects have been identified within the Water Environment and Flood Risk assessment of Section 5 and due to the large Flood Zone 3 extent within this section, it may be necessary to undertake monitoring during the construction phase for assurance purposes. The requirement for this will be assessed further within the ES when further characterisation of the hydrological regime has been undertaken.

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# 7. Geology and Hydrogeology

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# 7. Geology and Hydrogeology

## 7.1 Introduction

- 7.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Geology and Hydrogeology assessment for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 7.1.2 The assessment for Section 5 is based on a Refined Siting Zone boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 7.1.3 Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 7.1);
  - ii. Identification of key local and regional policy relevant to the assessment (section 7.2). 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 Geology and Hydrogeology assessment (section 7.3). 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 Geology and Hydrogeology assessment within Section 5 (section 7.4). 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 Section 5 Study Area relevant to the Geology and Hydrogeology assessment (section 7.5);
  - vi. A description of mitigation measures included for the purposes of the Geology and Hydrogeology assessment reported within the PEI Report (section 7.6). 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 Geology and Hydrogeology effects arising during construction and operation of the Project within Section 5, based upon the assessment completed to date (section 7.7); and

viii. An outline of the proposed monitoring requirements in relation to Geology and Hydrogeology (section 7.8).

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

Table 7.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 7.1 Superficial Geology</b> <b>Figure 7.2 Bedrock Geology</b> <b>Figure 7.3 Aquifer Designations – Superficial Deposits</b> <b>Figure 7.4 Aquifer Designations – Bedrock Geology</b> <b>Figure 7.5 Landfills, Waste and Potentially Contaminative Previous Land Uses</b>
<b>PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification</b>	A list of identified sites with potentially contaminative uses within the Section 5 Study Area, a table identifying the risk classification criteria and an initial risk classification for each feature, to allow a proportionate assessment of potential effects within the PEI Report.
<b>PEI Report Volume 3 Part B Sections 1 to 7 Appendix 7B Minerals Safeguarding Report</b>	A report for the full Study Area across the Project which identifies any safeguarded minerals and provides an appraisal of the effects of the Project against relevant minerals policy.
<b>Project Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.

Supporting Information	Description
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.

- 7.1.5 There are interrelationships related to the potential effects on Geology and Hydrogeology 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 5 Chapter 4 Ecology and Biodiversity** should be consulted in relation to effects identified by the Geology and Hydrogeology assessment including impacts on land and groundwater quality, that may affect ecological receptors, such as Groundwater Dependent Terrestrial Ecosystems (GWDTE) and Sites of Specific Scientific Interest (SSSI).
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 6 Water Environment** should be consulted in relation to the effects on groundwater, including impacts on groundwater quality and quantity, identified by the Geology and Hydrogeology

- assessment that may affect hydrological receptors, such as surface water receptors;
- iii. **PEI Report Volume 2 Part B Section 5 Chapter 8 Agriculture and Soils** should be consulted in relation to temporary and permanent loss of soils and soil functions and how the Project may impact the shallow soils across the Study Area.
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
  - v. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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

### Legislation and National Policy

- 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, detail of which is 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. South East Lincolnshire, 2019. South East Lincolnshire Local Plan 2011 – 2036 (Ref 1):
    - Policy 28 – The Natural Environment: sets out the requirements for development proposals to prevent impacts on locally-designated sites (relevant for Geological Conservation Sites); and
    - Policy 30 – Pollution: sets out requirements for development proposals to prevent impacts on the land quality/condition (relevant for geology receptors) and groundwater quality (relevant for hydrogeology receptors).
  - ii. Greater Lincolnshire Nature Partnership, 2021. Geodiversity Strategy 2022 – 26 (Ref 2): this document sets out the Geodiversity Action Plan (GAP) and a summary of geodiversity sites within Lincolnshire, along with planning and conservation advice for sites of geodiversity value; and
  - iii. Lincolnshire County Council, 2017. Lincolnshire Minerals and Waste Local Plan Core Strategy and Development Management Policies (Ref 3): sets out the key principles for working of minerals and waste management development in Lincolnshire and the development management policies for minerals and waste which will be considered for any future planning applications.

## 7.3 Scope of Assessment

- 7.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 4) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following submission of the EIA Scoping Report (Ref 5). 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 Geology and Hydrogeology 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 Feedback Report**.
- 7.3.3 The scope of the construction assessment covers the following receptor groups:
- i. Human health (construction workers, adjacent land users) – only in the context of land contamination assessments (various other aspects of human health are addressed in **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing**);
  - ii. Groundwater aquifers;
  - iii. Groundwater abstractions;
  - iv. Soil/land quality – only in the context of land contamination assessments (other aspects being addressed in **PEI Report Volume 2 Part B Section 5 Chapter 8 Agriculture and Soils**);
  - v. Structures; and
  - vi. Designated geological conservation sites (none present within the Section 5 Study Area).
- 7.3.4 The scope of the operation and maintenance assessment covers the following receptor groups:
- i. Human health (future land users) – only in the context of land contamination assessments (various other aspects of human health are addressed in **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing**);
  - ii. Groundwater aquifers;
  - iii. Groundwater abstractions; and
  - iv. Structures.

## 7.4 Assessment Methodology

- 7.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Geology and Hydrogeology 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 is outlined below.

- 7.4.2 The assessment for Geology and Hydrogeology has been undertaken in line with Land Contamination Risk Management (LCRM) guidance (Ref 6), which includes an approach for land contamination assessments in relation to human health, land and groundwater receptors. This guidance is based on the source-pathway-receptor approach, which forms the basis of the approach used for assessing effects relating to contamination. This approach is also consistent with the Environment Agency's (EA) Approach to Groundwater Protection (Ref 7) including the requirements noted in that guidance in relation to Nationally Significant Infrastructure Projects. The EA's guidance (Ref 7) also applies to physical effects on groundwater, forming the framework used for the assessment of these effects.
- 7.4.3 The assessment has been undertaken using recognised criteria based on Construction Industry Research and Information Association (CIRIA) Publication 552 Contaminated Land Risk Assessment: A Guide to Good Practice (Ref 8), adapted as necessary to support environmental impact assessment.
- 7.4.4 The assessment is expected to be developed further in the ES, where further relevant information becomes available, for example from ongoing consultation or additional data collection.

## Assessment Assumptions and Limitations

- 7.4.5 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 7.4.6 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**. There are no limitations specific to the Geology and Hydrogeology assessment for Section 5.
- 7.4.7 The key parameters and assumptions which inform the assessment 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.

## 7.5 Baseline Conditions

### Study Area

- 7.5.1 For the purposes of the Geology and Hydrogeology assessment, a general Study Area of the Refined Siting Zone plus a 250 m buffer for geological receptors and a 500 m buffer for hydrogeological receptors has been applied. This is considered to be a proportionate and suitable approach for this assessment, in line with the Scoping Opinion (Ref 4). As outlined within the Scoping Report (Ref 5), hydrogeological receptors further from the Study Area are more susceptible to effects from the Project than geological receptors due to the mobile nature of groundwater and corresponding potential for the Project to affect receptors at a greater distance, hence the larger Study Area for the hydrogeological assessment.

## Data Collection

- 7.5.2 The following data has been used to inform the baseline conditions:
- i. Published historical mapping to identify potentially contaminative former land uses (National Library of Scotland mapping), (Ref 9);
  - ii. UK Health Security Agency radon mapping (Ref 10);
  - iii. Geological mapping published by the British Geological Survey (BGS) (1:50,000 scale) (Ref 11);
  - iv. Historical borehole records held by the BGS (Ref 11), details of which are provided within **Table 7.2**;
  - v. Groundwater abstraction details (public and private), discharge consents, historical pollution incident records, and historical and authorised landfills, as available from the EA and Local Planning Authorities, obtained through formal data requests;
  - vi. Department for Environment, Food and Rural Affairs (DEFRA) groundwater aquifer information, provided through MAGIC (Multi-Agency Geographic Information for the Countryside) (Ref 12);
  - vii. Source Protection Zones (SPZ) data, available under Open Government License (Ref 13);
  - viii. EA Catchment Data Explorer records on groundwater quality (Ref 14);
  - ix. Natural England designated Sites, i.e. Geological SSSIs, provided through MAGIC (Ref 12);
  - x. Zetica Unexploded Ordnance (UXO) online hazard mapping (Ref 15);
  - xi. Records from South Holland District Council, including locations of any private water supplies, obtained through a formal data request and received on 07 November 2024; and
  - xii. Records on locally designated geological sites, including a review of relevant local planning documentation and readily available local geo-conservation documents.
- 7.5.3 The data sources listed above are as specified in the Scoping Report (Ref 5). Furthermore, where additional information over and above this is available from geotechnical assessments being undertaken in support of the engineering design of the Project, this supplementary information has also been used. This includes Groundsure historical feature polygons and geo-environmental data search records for partial coverage within the Study Area (approximately 2,900 ha in a 100 m wide swathe for the Project), originally obtained relative to earlier provisional engineering design alignment options. This dataset covers approximately 10 % of the Refined Siting Zone.

## Existing Baseline

- 7.5.4 The following section outlines the Geology and Hydrogeology baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:

- i. **PEI Report Volume 2 Part B Section 5 Figure 7.1 Superficial Geology;**
- ii. **PEI Report Volume 2 Part B Section 5 Figure 7.2 Bedrock Geology;**
- iii. **PEI Report Volume 2 Part B Section 5 Figure 7.3 Aquifer Designations – Superficial Deposits;**
- iv. **PEI Report Volume 2 Part B Section 5 Figure 7.4 Aquifer Designations – Bedrock Geology;**
- v. **PEI Report Volume 2 Part B Section 5 Figure 7.5 Landfills, Waste and Potentially Contaminative Previous Land Uses;**
- vi. **PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification;** and
- vii. **PEI Report Volume 3 Part B Sections 1 to 7 Appendix 7B Minerals Safeguarding Report.**

### **Topography and Current Land Use**

- 7.5.5 Section 5 covers the Refined Siting Zone, within which there will be up to two substations and a 400 kV overhead line between them, with a possibility for undergrounding. Section 5 also covers two sections of overhead line, which require diverting into the substation(s) from the north (from Lincolnshire Connection Substation (LCS) B) and south (from Walpole B Substation).
- 7.5.6 Section 5 is located northeast of Spalding and directly east of Surfleet Seas End and the River Welland, which enters the Refined Siting Zone in the northeast of Section 5 and runs parallel to the Refined Siting Zone to the southeast through the Section 5 Study Area.
- 7.5.7 The land within Section 5 is primarily used for agricultural purposes and there are no major roads within the Refined Siting Zone. The A151 is located immediately southeast of the Refined Siting Zone and within the Section 5 Study Area, and the A16 is present in the southwest of the Section 5 Study Area. There are also minor/local roads in several locations in Section 5. A small agricultural building is evident on current aerial imagery within the Refined Siting Zone in the centre of Section 5, which appears to be a barn (or similar) associated with an adjacent farm. Localised residential properties and farm buildings are present beyond the extent of the Refined Siting Zone and within the Section 5 Study Area, with the village of Weston in the southeast of the Section 5 Study Area.
- 7.5.8 The land across the Section 5 Study Area is shown to be generally flat lying on Ordnance Survey (OS) mapping, with only occasional topographic highs of less than 10 m above ordnance datum (AOD). The low-lying nature of the land, as discussed above, is such that frequent surface water features are present across the Section 5 Study Area, including ponds, drains and streams, and the River Welland is in the north and west of the Section 5 Study Area.
- 7.5.9 Existing overhead electricity lines are present within the Section 5 Study Area and within the Refined Siting Zone, shown on aerial imagery and historical mapping, with one existing overhead line (4ZM) orientated northwest to southeast through the Section 5 Study Area and a second existing overhead line (2WS) northeast to southwest, from the centre of the Refined Siting Zone to the southwest beyond the Section 5 Study Area. These existing overhead lines will require modifications and connection to the substation(s) in Section 5.



- 7.5.10 Aerial imagery indicates commercial built development within the Section 5 Study Area, with no notable features within the Refined Siting Zone but those within the Section 5 Study Area include a plant nursery with above ground tanks, warehouses, miscellaneous storage areas, an auto centre and a scrap yard. Further details about these land uses (e.g. locations and distances from the Refined Siting Zone) are provided in **PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification**.

### Historical Land Use

- 7.5.11 Historical surface ground workings are recorded within the north of the Refined Siting Zone for Section 5, southeast of the River Welland, dated between 1886 and 1973 and associated with a pond which is shown on current aerial imagery.
- 7.5.12 Tanks are recorded on historical mapping in three locations within the Section 5 Study Area, one within the eastern section of the Refined Siting Zone and two outside of the Refined Siting Zone (one to the west and one to the east). Further details about these land uses (e.g. locations and distances from the Refined Siting Zone) are provided in **PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification**.

### Geology

#### Made Ground

- 7.5.13 There are no recorded artificial deposits on published geological mapping (Ref 11) within the Section 5 Study Area.
- 7.5.14 Isolated Made Ground deposits are expected throughout the Refined Siting Zone and Section 5 Study Area adjacent to access tracks and roads and in areas of historical and current land uses, as noted within the 'Historical Land Use' and 'Topography and Current Land Use' sections above.

#### Superficial Deposits

- 7.5.15 The Section 5 Study Area is recorded to be entirely underlain by superficial deposits comprising Tidal Flat deposits, consisting of clay and silt. The distribution of superficial deposits within the Section 5 Study Area are shown on **PEI Report Volume 2 Part B Section 5 Figure 7.1 Superficial Geology**.

#### Bedrock

- 7.5.16 The Section 5 Study Area is almost entirely underlain by mudstone of the Oxford Clay Formation, typically described as smooth to slightly silty mudstone with sporadic beds of argillaceous limestone nodules. Mudstone and siltstone of the West Walton Formation, typically described as calcareous mudstone, silty mudstone and siltstone, with subordinate fine-grained sandstones and argillaceous limestone or siltstone nodules, is recorded within the southeast of the Section 5 Study Area, although not within the Refined Siting Zone.
- 7.5.17 The distribution of bedrock strata within the Section 5 Study Area is shown on **PEI Report Volume 2 Part B Section 5 Figure 7.2 Bedrock Geology**.

## Geological Setting

- 7.5.18 No linear geological features (e.g. faults, breaklines, etc.) are recorded within the Section 5 Study Area. Published geological mapping (Ref 11) shows the bedrock strata as being generally horizontal across the Section 5 Study Area, with no indication of strata dip.
- 7.5.19 Borehole records published by the BGS within the Refined Siting Zone have been reviewed as part of this assessment to help confirm the anticipated geological sequence in line with the published geological mapping. Seven BGS borehole records (Ref 11) are located within the Refined Siting Zone and these have been summarised in **Table 7.2** below.

**Table 7.2** Summary of British Geological Survey Boreholes Within the Refined Siting Zone for Section 5

<b>Borehole ID</b>	<b>Location (Easting, Northing)</b>	<b>Location Description</b>	<b>Stratigraphy</b>
TF23SE10	528660, 330190	Southwest of pylon LW199, north of River Welland	<ul style="list-style-type: none"> <li>• 0 – 0.15 m: Clay</li> <li>• 0.15 – 12.19 m: Silty sand</li> </ul>
TF22NE12	528970, 329990	Southeast of River Welland	<ul style="list-style-type: none"> <li>• 0 – 0.30 m: Topsoil</li> <li>• 0.30 – 12.19 m: Silty sand/sandy silt</li> </ul>
TF22NE13	529050, 329660	Southeast of River Welland, west of Marsh Road	<ul style="list-style-type: none"> <li>• 0 – 0.30 m: Topsoil</li> <li>• 0.30 – 1.22 m: Sandy clay</li> <li>• 1.22 – 12.19 m: Silty sand</li> </ul>
TF22NE10	529710, 328800	East of Marsh Road, west of an unnamed road and Lord's Drain, south of Western Barn House	<ul style="list-style-type: none"> <li>• 0 – 0.61 m: Silty sandy clay</li> <li>• 0.61 – 1.83 m: Sandy silt</li> <li>• 1.83 – 12.19 m: Silty sand</li> </ul>
TF22NE9	529940, 328500	South of Western Barn House and west of Lord's Drain	<ul style="list-style-type: none"> <li>• 0 – 0.91 m: Sandy silt</li> <li>• 0.91 – 12.19 m: Silty sand</li> </ul>
TF32NW13	530130, 328250	South of Western Barn House and north of St Lamberts Cottage, east of Lord's Drain	<ul style="list-style-type: none"> <li>• 0 – 0.84 m: Sandy silt</li> <li>• 0.84 – 12.19 m: Silty sand</li> </ul>

Borehole ID	Location (Easting, Northing)	Location Description	Stratigraphy
TF32NW12	530350, 327970	East of Lord's Drain and northeast of St Lamberts Cottage	<ul style="list-style-type: none"> <li>• 0 – 0.46 m: Sandy clay</li> <li>• 0.46 – 2.13 m: Sandy silt</li> <li>• 2.13 – 12.27 m: Silty sand</li> </ul>

7.5.20 The geological logs as summarised above suggest some variance from the published BGS geological mapping (Ref 11), as the mapping describes Tidal Flat deposits generally as clay and silt whereas the logs indicate a more substantial granular (sand) content. The mapping description relates to the nature of Tidal Flat deposits in general, and it appears based on the logs that there are local variations (resulting from original depositional processes) that mean that there is a greater sand content in this area.

7.5.21 No Local Geological Sites or sites nationally designated for their geological importance (e.g. SSSI) are located within the Section 5 Study Area.

7.5.22 An area of saltmarsh is recorded by the EA in the north of Section 5 within the Refined Siting Zone on either side of the River Welland, east of Surfleet. This area is classified by the EA as Mid-Low degree or frequency of immersion in seawater (Ref 16).

7.5.23 Relevant information from the BGS geohazards database information that is available is summarised below. The limitations associated with this dataset, including the basis of its spatial extent, are discussed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. The geohazards classifications are described relative to the superficial geology, so reference to **PEI Report Volume 2 Part B Section 5 Figure 7.1 Superficial Geology** should be made.

7.5.24 The Tidal Flat deposits are classified as Class D in relation to compressibility, meaning that compressibility and uneven settlement hazards are probably present. These deposits are also classified as Class C for shrink swell clays, meaning ground conditions are predominantly medium plasticity, and Class D for running sands, defined by the BGS as 'running sands conditions are probably present'.

### Hydrogeology

7.5.25 The superficial deposits (Tidal Flat deposits) and solid strata (mudstone of the Oxford Clay Formation and mudstone and siltstone of the West Walton Formation) across the Section 5 Study Area are designated as Unproductive Strata, defined as strata which have negligible significance for water supply or baseflows to rivers, lakes and wetlands.

7.5.26 The designations and spatial distribution of the superficial and bedrock aquifers within the Section 5 Study Area are shown on **PEI Report Volume 2 Part B Section 5 Figure 7.3 Aquifer Designations – Superficial Deposits** and **PEI Report Volume 2 Part B Section 5 Figure 7.4 Aquifer Designations – Bedrock Geology**.

- 7.5.27 The Section 5 Study Area is not located within any groundwater bodies monitored by the EA as part of the Water Framework Directive (WFD), due to the unproductive nature of both the superficial deposits and solid strata within Section 5.
- 7.5.28 No drinking water safeguard zones or nitrate vulnerable zones (NVZ) are present within the Section 5 Study Area.

### Groundwater Levels

- 7.5.29 The EA does not hold any records for groundwater levels within the Section 5 Study Area.
- 7.5.30 The BGS does not hold any records of monitored groundwater levels within the Section 5 Study Area. However, the BGS borehole records (Ref 11) can provide groundwater level information, if groundwater was encountered during drilling. The BGS borehole records indicate the presence of variable groundwater levels within the Tidal Flat deposits, with two of the seven borehole logs that are located within the Refined Siting Zone recording an absence of groundwater whilst the remaining five recorded shallow groundwater at between 0.9 and 2.7 m depth. Whilst these records are from 1963, so may not reflect precise groundwater levels at present day, they indicate that generally the Refined Siting Zone would be expected to contain shallow perched groundwater in the Tidal Flat deposits, which may be laterally discontinuous, which is consistent with the geological setting of this area. The extent and depth of this shallow groundwater would be expected to vary seasonally.

### Source Protection Zones

- 7.5.31 No groundwater source protection zones (SPZ) are present within the Section 5 Study Area, due to the unproductive nature of the superficial and bedrock strata within this Section.

### Abstractions

- 7.5.32 There are no recorded groundwater abstractions within the Section 5 Study Area, due to the unproductive nature of the superficial and bedrock strata.
- 7.5.33 South Holland District Council have provided records of private water supplies within their district area, none of which are within the Section 5 Study Area. The locations of the private water supplies are shown on **PEI Report Volume 2 Part B Section 5 Figure 7.4 Aquifer Designations – Bedrock Geology**.

### Environmental Setting

- 7.5.34 Zetica UXO online risk mapping (Ref 15) shows the Section 5 Study Area as lying entirely within an area of Low bomb risk with no strategic targets. The closest strategic target to Section 5 is located approximately 2.75 km southwest of the Refined Siting Zone boundary and is recorded as a UXO find, to the east of Spalding.
- 7.5.35 There are no recorded historical or active landfills, waste exemptions or recorded waste sites within the Section 5 Study Area.
- 7.5.36 The South Holland District Council does not record any sites designated as 'contaminated land' in accordance with Part 2A of the Environmental Protection Act (1990) (Ref 17). They have advised that they do not hold any other publicly available information regarding potentially contaminative historical land uses.

## Pollution Incidents

- 7.5.37 The EA has recorded two pollution incidents within the Section 5 Study Area.
- 7.5.38 One Category 4 (no impact for both land and water) pollution incident is recorded just beyond the extent of the Refined Siting Zone within the north of Section 5, immediately north of the River Welland. This pollution incident is dated 2007 and is associated with fly tipping, although no pollutant type is recorded.
- 7.5.39 Another pollution incident is recorded within the south of the Section 5 Study Area, approximately 60 m south of the Refined Siting Zone. This incident is dated 2012 and is recorded to have had a Category 3 (minor) impact on water, and Category 4 (no impact) on land and air, associated with unauthorised disposal of sewage effluent and vegetable washings.
- 7.5.40 The locations of recorded historical pollution incidents within the Section 5 Study Area are shown on **PEI Report Volume 2 Part B Section 5 Figure 7.5 Landfills, Waste and Potentially Contaminative Previous Land Uses**.

## Discharge Consents

- 7.5.41 There are no recorded discharge consents within the Section 5 Study Area.

## Radon

- 7.5.42 The full Section 5 Study Area is recorded as being in an area where less than 1% of homes are at or above the radon Action Level, which is the lowest risk category defined by the UK Health Security Agency (Ref 10).

## Minerals

- 7.5.43 A Minerals Safeguarding Report has been prepared for the Project, which is provided in **PEI Report Volume 3 Part B Sections 1 to 7 Appendix 7B Minerals Safeguarding Report**. This report identifies the safeguarded minerals and safeguarded areas within the draft Order Limits and the Refined Siting Zone boundary. It also identifies any potential effects on these as a result of the Project, within the context of relevant mineral safeguarding policy.
- 7.5.44 There are no recorded safeguarded minerals or mineral safeguarding areas within the Section 5 Study Area and the minerals report has not identified any potentially significant effects on safeguarded minerals. Therefore, these have not been considered within this PEI Report, in line with the agreed approach within the Scoping Opinion (Ref 4).

## Future Baseline

- 7.5.45 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.
- 7.5.46 At this preliminary stage, a full assessment of the implications of any committed development projects 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 **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.

- 7.5.47 It is currently anticipated that, subject to gaining development consent in 2028, construction works would begin in 2029 and be completed by 2033. Up to and including that period, it is not expected that ground conditions, with respect to land contamination and geology, would change significantly. This assumes that any future activities undertaken within the Study Area would be permitted or controlled in accordance with current contaminated land legislation.
- 7.5.48 Hydrogeological conditions are more susceptible to change and therefore may be affected by the following factors:
- i. Climate change – changes in rainfall can affect aquifer recharge, groundwater levels and flow gradients (including consequent effects on the movement of contaminants in the ground);
  - ii. Future developments - such developments that are completed prior to the construction start date of the Project, including housing – increases in housing within the areas surrounding the Study Area have the potential to affect recharge to the underlying aquifers. Increased demand for drinking water associated with these can also affect future water resources and groundwater levels in aquifers; and
  - iii. Change in nitrate concentrations due to changes in land use or leaks from infrastructure - leaking waste water infrastructure represents a potential diffuse source of nutrients (nitrogen and phosphorus), other contaminants (e.g. heavy metals) and coliform bacteria to groundwater.
- 7.5.49 It is not considered likely at this stage that any change to the baseline conditions would significantly affect the assessment of effects within Section 5. This will remain under review prior to submission of the ES, to ensure that any changes in circumstances are considered on a case-by-case basis.

## 7.6 Design, Control and Additional Mitigation Measures

### Design Mitigation Measures

- 7.6.1 The Project and draft Order Limits have been designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 18) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 19) 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 20) 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 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that

potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.

## Control Mitigation Measures

7.6.3 A Preliminary CoCP has been prepared for this project, provided in **PEI Report Volume 3 Part B Appendix 5A Preliminary Code of Construction Practice**. The control and management measures included within the Preliminary CoCP relevant to Geology and Hydrogeology within Section 5 include:

- i. GH01: Intrusive ground investigations and assessment will be undertaken prior to construction which will inform appropriate geotechnical design in relation to the Study Area/structure specific ground conditions including ground instability/adverse ground conditions.
- ii. GH02: Construction methods such as appropriate piling techniques will be required to minimise the risk of mixing of aquifer bodies through the creation of new pathways. This includes the provision of a Foundation Works Risk Assessment (FWRA), which would be undertaken once the proposed foundation solutions are known, in accordance with CL:AIRE guidance 'Piling and Penetrative Ground Improvement Methods on Land Affected by Contamination: Guidance on Pollution Prevention' (Ref 21).
- iii. GH03: Appropriate training of construction and maintenance workers in the handling and use of potentially hazardous substances and the associated risks.
- iv. GH04: All use and storage of chemicals to be undertaken in accordance with The Control of Pollution (Oil Storage) Regulations 2001 and EA guidance 'Protect groundwater and prevent groundwater pollution' (Ref 22).
- v. GH05: Any temporary dewatering activities during construction will be undertaken in accordance with EA guidance (Ref 7), and if required, an Abstraction Licence and Environmental Permit (for the discharge) and will be limited to the depth and time required to facilitate construction activities.
- vi. GH06: General good practice environmental and waste management procedures for construction sites (e.g. regular vehicle checks, use of spill kits, correct waste storage and disposal).
- vii. GH07: If required (e.g. for maintenance during the operational phase), herbicides to be used in accordance with relevant DEFRA guidance (Ref 23).
- viii. GH11: A protocol for dealing with any unexpected contamination will be included in the CEMP.
- ix. W05: The contractor(s) will comply with all relevant consent conditions or DCO provisions regarding de-watering and other discharge activities. This will particularly be with regard to volumes and discharge rates, but also to water quality (particularly suspended solids, pH and hydrocarbons) and will include discharges to land, water bodies or third-party drains/sewers.
- x. GG21: A Material and Waste Management Plan (MWMP) will be developed prior to construction. The MWMP shall include but not be limited to:
  - Waste forecasts.

- Identification of recovery routes.
- Actual waste figures once work has begun.
- Consideration will be given to the guidance in the Code of Practice developed by Contaminated Land: Applications in Real Environments (CLAIRE) “A Definition of Waste: Development Industry Code of Practice (DoWCoP)” (Ref 24). Dedicated waste management areas will be designed to sufficiently accommodate the types and volumes of waste produced and to reduce the environmental risk of storing waste on-site (covered, secured and away from drainage).
- The control of earthworks and the movement of excavated materials (including any re-use of excavated materials) will be achieved under appropriate Environmental Permits, exemptions or the DoWCoP.

## Additional Mitigation Measures

- 7.6.4 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.
- 7.6.5 Additional mitigation measures are not anticipated to be required in relation to Geology and Hydrogeology effects. However, this will remain under review during the completion of further assessment and development of the ES.

## 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 Section 5 Study Area, as a result of construction, operational and/or maintenance activities..
- 7.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures, as previously described.
- 7.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A summary of all non-significant effects is included within this Section in **Table 7.3**, based upon the assessment scope detailed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 7.7.4 It should be noted that the assessment which has informed the conclusions presented remains ongoing and is subject to change, due to the ongoing data collection and further design development of the Project. 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 Geology and Hydrogeology receptors within Section 5, as a result of the construction phase of the Project.



## Operation and Maintenance

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

## Likely Non-Significant Effects

- 7.7.7 For completeness, **Table 7.3** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Geology and Hydrogeology effects.

Table 7.3 Preliminary summary of non-significant Geology and Hydrogeology effects – Section 5

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
<b>Construction</b>					
Construction workers and adjacent land users (Human health)	Harm to human health through exposure to contamination, including dust and vapours, through disturbance of the ground during construction that is affected by pre-existing contamination	Medium (construction workers)	Negligible	Negligible - not significant	<p>A number of potential contamination sources have been identified within the Section 5 Study Area with a moderate or greater contamination potential and these are summarised within <b>PEI Report Volume 3 Part B Section 5 Appendix 5A Initial Contamination Risk Classification</b>.</p> <p>The only feature classified as having greater than a low contamination potential within the Refined Siting Zone is a historical tank, located off Hall Gate in the east of Section 5, recorded on historical mapping between the 1940's and 1970's. Current aerial imagery does not suggest a tank in this location. It is not recorded whether this is a water tank (in which case it would not present a contamination risk) or a fuel/chemical/fertiliser tank (in which case there may be a risk of residual contamination). Ground disturbance within this area (associated with the substation(s) construction or undergrounding of existing Distribution Network Operator (DNO) assets) may be required.</p>

<sup>1</sup> Geological Conservation Sites have not been included as receptors within this table due to their absence within the Section 5 Study Area. Groundwater abstractions and bedrock groundwater aquifers have not been included within this table due to their absence within the Section 5 Study Area.

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
					<p>With the use of appropriate personal protective equipment (PPE) and implementation of control measures (GH01 – pre-construction ground investigation, GH06 – which would include dust and leachate control, GH11 – protocol for unexpected contamination and GG21 – control of earthworks and materials movement) included within the Preliminary CoCP (provided in <b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>), the exposure pathways would be reduced/prevented such that the effects on construction workers are not significant.</p>
		High (adjacent land users)	Negligible	Negligible – not significant	<p>The potential contamination sources within the Section 5 Study Area are summarised within <b>PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification</b>.</p> <p>With the implementation of control measures (GH01, GH06 – which would include dust and leachate control, and GH11) detailed within the Preliminary CoCP (<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>), the exposure pathways would be reduced/prevented such that the effects on adjacent land users are not considered to be significant.</p>

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
Groundwater	Deterioration in chemical quality of the groundwater through disturbance of the ground during construction that is affected by pre-existing contamination	Negligible – Tidal Flat deposits	Negligible	Negligible – not significant	<p>Potential contamination sources within the Section 5 Study Area (summarised within <b>PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification</b>) have the potential to negatively affect groundwater if pre-existing contamination is mobilised during construction. The only feature within the Refined Siting Zone and a possible area of ground disturbance is a historical tank (it is unknown whether this relates to water or fuel/chemicals/fertiliser).</p> <p>Whilst classified as Unproductive Strata (negligible sensitivity receptor), it is noted from BGS borehole records that the Tidal Flat deposits (which locally may contain a notable granular content) would be expected to contain shallow groundwater. This may be encountered during excavations associated with substation construction, but such excavations would generally not be expected to disturb areas at risk of containing pre-existing contamination, which would be confirmed through pre-construction ground investigation (control measure GH01) and the implementation of a protocol for unexpected contamination (control measure GH11), to ensure no significant adverse effects to groundwater (for example in the former tank location).</p> <p>Piling may be required for the substation(s) and pylon foundations within Section 5. There is</p>

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
					<p>potential for piling to introduce pathways for the mixing of groundwater at different levels within these Tidal Flat deposits. Control measure GH02 within the Preliminary CoCP (provided in <b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>) includes the use of suitable piling methods, in accordance with a foundation works risk assessment, to prevent pathway creation, if pre-existing contamination is encountered during construction.</p> <p>In summary, given the generally low risk of a contamination source, together with the implementation of control measures GH01, GH02 and GH11 within the Preliminary CoCP (<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>), and the negligible sensitivity of the receptor (Unproductive Strata), the effects on groundwater would not be significant.</p>
Groundwater	Physical effects on groundwater, such as depletion of the aquifer and increased solids/turbidity, through dewatering activities (e.g. during excavations for foundations for	Negligible – Tidal Flat deposits	Negligible	Negligible – not significant	The superficial deposits within the Section 5 Study Area are designated as Unproductive Strata (negligible sensitivity receptor). Nevertheless, the Tidal Flat deposits are expected to contain shallow groundwater (variable depths and extent) and limited groundwater control/pumping may be required for construction within the superficial deposits. This has the possibility to reduce groundwater levels locally and increase suspended

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	new structures) and changes to groundwater flows caused by construction activities and generation of solids through ground disturbance				<p>solids/turbidity in this negligible sensitivity receptor.</p> <p>Temporary groundwater control/pumping during excavations for the substation(s) and pylon foundations or open trenching for undergrounding of DNO assets would be undertaken in accordance with EA guidance (control measure GH05 within the Preliminary CoCP, provided in <b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>). Any effects on groundwater in the Tidal Flat deposits (negligible sensitivity receptor) would not be significant.</p> <p>As well as temporary groundwater control/pumping, the other physical effect on groundwater requiring consideration is the generation of solids by physical disturbance of the ground during construction. With the implementation of control measures (GH02, GH09 – controls for undergrounding of existing DNO assets through horizontal directional drilling, and GG21) in the Preliminary CoCP to ensure physical effects are appropriately minimised and controlled, these effects on groundwater would not be significant.</p>
Groundwater	Physical and chemical effects on groundwater	Negligible – Tidal Flat deposits	Negligible	Negligible – not significant	Any discharge of water generated during construction (e.g. from pylon and substation(s) foundations excavations) to land would be of

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	and/or surface water as a result of the discharge of groundwater, such as increased solids/turbidity and reduction in chemical quality, arising from dewatering or surface water control				unpolluted water only and undertaken in accordance with control measure W05 (compliance with discharge conditions) within the Preliminary CoCP (provided in <b>PEI Report Volume 3 Part B Appendix 5A Preliminary Code of Construction Practice</b> ). Discharges directly to groundwater are not anticipated. Therefore, there is not considered to be a significant effect on groundwater.
Soil/land quality	Deterioration in chemical quality of the land through release of contamination by construction activities	Medium	Negligible	Negligible – not significant	Soil/land quality can be negatively affected by construction due to the inadvertent release of contamination and/or incorrect storage and re-use of excavated soils.  With the implementation of control measures (GH03 – adequate training of workers in managing hazardous substances, GH04 - appropriate storage of chemicals and health and safety measures for construction sites, GH06, GH09 and GG21) within the Preliminary CoCP (provided in <b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b> ), the effects on soil/land quality are not significant.
Groundwater	Deterioration in chemical quality of the groundwater	Negligible – Tidal Flat deposits	Negligible	Negligible – not significant	The superficial deposits across the Section 5 Study Area are designated by the EA as Unproductive Strata (negligible sensitivity

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	through release of contamination by construction activities (e.g. loss of fuels to an aquifer)				receptor), but nevertheless are expected to contain shallow groundwater of variable extent and depth. With the implementation of control measures (GH03, GH04, GH06, GH09 and GG21) within the Preliminary CoCP (provided in <b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b> ), releases of contamination should be adequately reduced/prevented such that the effects on groundwater are not significant.
Construction workers, adjacent land users (Human health)	Explosion or asphyxiation as a result of ingress and accumulation of ground gas within buildings or other confined spaces	High	Negligible	Negligible – not significant	<p>No specific sources of ground gas or potential ground gas-generating materials were identified within the assessment of baseline conditions for Section 5.</p> <p>Should ground investigations undertaken prior to construction (control measure GH01 within the Preliminary CoCP, provided in <b>PEI Report Volume 3 Part B Appendix 5A Preliminary Code of Construction Practice</b>) identify the presence of hazardous ground gases, the effect would be mitigated through the use of personal protective equipment (PPE) and appropriate health and safety compliance (control measure GH03 within the Preliminary CoCP, an FWRA (control measure GH02), and suitable construction at any temporary structures to prevent accumulation of ground gas. Therefore, there is not considered to be a significant effect on construction workers.</p>



Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
					The FWRA (within control measure GH02) will consider and provide suitable controls for the risk of piling activities causing lateral migration of ground gas if disturbed during construction, to ensure that there are no risks to occupants/users of nearby buildings.
Structures	Explosion as a result of ingress and accumulation of ground gas within buildings or other confined spaces	Medium	Negligible	Negligible – not significant	<p>As detailed above, no specific sources of ground gas or potential ground gas-generating material were identified within the assessment of baseline conditions for Section 5.</p> <p>Should ground investigations undertaken prior to construction (control measure GH01 within the Preliminary CoCP, provided in <b>PEI Report Volume 3 Part B Appendix 5A Preliminary Code of Construction Practice</b>) identify the presence of hazardous ground gases or materials with the potential to generate these (e.g. Made Ground or natural materials with degradable content), suitable construction of any temporary structures (i.e. construction compounds) will prevent ground gas migration towards adjacent structures, as such, the pathways would be identified and mitigated such that the effects on structures are not significant.</p>
Adjacent land users, construction workers	Unstable ground and damage to buildings or property through	High (Human health)	Negligible	Negligible – not significant	Based on the mapped geology and currently available information from the BGS geohazards data set, it is considered that natural geohazards can be mitigated through suitable

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
(Human health) Structures	disturbance of unstable ground by construction activities	Medium (Structures)			engineering design (in accordance with standard good practice) such that adverse effects should not occur. As such, there is not considered to be a significant effect.
Soil/land quality Adjacent land users, construction workers (Human health) Structures	Ground stability issues through dissolution of soluble rocks, due to changed patterns of groundwater flow/discharges caused by construction activities	High (Human health)  Medium (Structures and soil/land quality)	Negligible	Negligible – not significant	The BGS records the bedrock within the Section 5 Study Area as comprising mudstone of the Oxford Clay Formation and mudstone and siltstone of the West Walton Formation. These strata are not considered to be soluble rocks and are not liable to dissolution through changes in groundwater flow or discharges from construction. Therefore, there are no possible effects.

### Operation and Maintenance

Future land users (Human health) Structures	Harm to health of the substation(s) operatives due to explosions or asphyxiation as a result of ingress and accumulation of ground gas within structures, through manual access required to	High (Human health)  Medium (Structures)	Negligible	Negligible – not significant	No specific sources of ground gas or ground gas generating potential were identified within the initial contamination risk assessment (provided in <b>PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification</b> ). However, the Tidal Flat deposits may include variable content of organic material which can degrade and produce ground gases.  Should ground investigations undertaken prior to construction (control measure GH01 within the Preliminary CoCP, provided in <b>PEI Report</b>
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Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	operate the substation(s)				<b>Volume 3 Part B Appendix 5A Preliminary Code of Construction Practice</b> ) identify the presence of hazardous ground gases or materials with the potential to generate these (e.g. Made Ground or natural materials with degradable content), the substations would be designed to incorporate appropriate gas protection (if required). Therefore, there is not considered to be a significant effect.
Groundwater	Changes to infiltration and corresponding effects on groundwater levels as a result of the presence of new structures and impermeable surfaces	Negligible – Tidal Flat deposits	Minor	Negligible – not significant	The construction of up to two substations within Section 5 will introduce new impermeable surfacing and engineered drainage. Whilst the impermeable surfacing and drainage will affect run-off and recharge to the Tidal Flat superficial deposits within the Refined Siting Zone, this would not be expected to substantively deplete shallow groundwater levels in the area or cause significant effects, given the negligible sensitivity of the receptor and wider recharge capacity in the area surrounding the substation site. It would also not be expected to substantively increase shallow groundwater levels, given that these already appear to be shallow and that the drainage approach will be an engineering design compliant with relevant flood risk requirements. Therefore, there is not considered to be a significant effect.
Future land users,	Harm to human health through	Medium	Negligible	Negligible – not significant	No specific potential contamination sources have been identified within the Refined Siting

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
adjacent land users	exposure to contamination, including dust and vapours through disturbance of pre-existing contamination (Disturbance of pre-existing contamination may occur through infrequent maintenance or repair activities requiring excavations for inspection/access to utilities, below ground infrastructure or foundations)				<p>Zone with a moderate or greater contamination potential in the initial contamination risk assessment (provided within <b>PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification</b>), with the exception of a historical tank.</p> <p>It is considered that the degree of ground disturbance associated with maintenance activities would be no greater than that associated with construction, which have been determined not to be significant for Section 5. There is also a minimal risk of encountering unexpected contamination during the maintenance phase, as this would already be known and understood from the construction phase.</p> <p>It is considered that, with suitable health and safety measures, any risks to human health would be suitably mitigated. Therefore, the effects on human health are not significant.</p>
Groundwater	Deterioration in chemical quality of the groundwater through disturbance of pre-existing contamination (Disturbance of pre-existing	Negligible – Tidal Flat deposits	Negligible	Negligible – not significant	No specific potential contamination sources have been identified within the Refined Siting Zone with a moderate or greater contamination potential in the initial contamination risk assessment (provided within <b>PEI Report Volume 3 Part B Section 5 Appendix 7A Initial Contamination Risk Classification</b> ), with the exception of a historical tank.

Receptor <sup>1</sup>	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
	contamination may occur through infrequent maintenance or repair activities requiring excavations for inspection/access to utilities, below ground infrastructure or foundations)				Any contamination associated with this potential source would be known and understood from the construction phase and any work involving disturbance of the ground would be planned and undertaken accordingly, complying with suitable environmental controls, to prevent the release of contaminants to the sensitive aquifers. Maintenance activities are also typically much less intrusive than construction activities and any resulting effects therefore would be smaller than during the construction phase, where these effects were determined to be negligible (not significant). Therefore, there is not considered to be a significant effect.

## **7.8 Monitoring**

- 7.8.1 As no significant effects have been identified within this assessment, it is not considered necessary to undertake any monitoring prior to and within the construction phase for assurance purposes within the Section 5 Study Area.

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# 8. Agriculture and Soils

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# 8. Agriculture and Soils

## 8.1 Introduction

- 8.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Agriculture and Soils assessment for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 8.1.2 The assessment for Section 5 is based on a Refined Siting Zone Boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 8.1.3 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 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 Agriculture and Soils assessment (section 8.3). 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 Agriculture and Soils assessment within Section 5 (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 Section 5 Study Area relevant to the Agriculture and Soils assessment (section 8.5);
  - vi. A description of mitigation measures included for the purposes of the Agriculture and Soils assessment reported within the PEI Report (section 8.6). 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 Agriculture and Soils effects arising during construction and operation of the Project within Section 5, based upon the assessment completed to date (section 8.7); and

viii. An outline of the likely monitoring requirements in relation to Agriculture and Soils (section 8.8).

8.1.4 Further supporting information is set out in **Table 8.1** below, including supporting figures and technical appendices.

Table 8.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
PEI Report Volume 2 Part B Section 5 Figures	<p><b>Figure 8.1 National Soil Map</b></p> <p><b>Figure 8.2 Provisional Agricultural Land Classification</b></p> <p><b>Figure 8.3 Detailed Agricultural Land Classification</b></p> <p><b>Figure 8.4 Woodland and Forestry Schemes</b></p> <p><b>Figure 8.5 Agri-Environment Schemes</b></p>
<b>Project Specific Supporting Documentation</b>	
PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
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 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 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

Supporting Information	Description
	design development process, including the main reasons for selecting the chosen option.
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 8.1.5 There are also interrelationships between the potential effects on Agriculture and Soils and other environmental topics. Therefore, reference should also be made to the following chapters within **PEI Report Volume 2 Part B** and **Part C**:
- i. **PEI Report Volume 2 Part B Section 5 Chapter 2 Landscape** should be consulted in relation to the landscape setting (for example topography) which can influence land use in any given location;
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 4 Ecology and Biodiversity** should be consulted in relation to the ecology receptors and biodiversity value which can, in part, be influenced by the presence of Agri-environment and Woodland and Forestry Schemes and which may, in turn, be relevant to soil ecosystem services (such as potential for soil carbon sequestration associated with some habitat types);
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 5 Water Environment** should be consulted in relation to the details of the water environment which interacts with the soil, for example in relation the land drainage, infiltration rates, erosion risk and flood risk;
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 7 Geology and Hydrogeology** should be consulted in relation to geology present within the Section and how the underlying geology influences soil characteristics and how soil characteristics may influence groundwater recharge;
  - v. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment;
  - vi. **PEI Report Volume 2 Route-wide Chapter 8 Agriculture and Soils (route-wide summary)** should be consulted in relation to the impacts on Agriculture and Soil receptors across the entire Project and any significant effects; and
  - vii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in

cumulative environmental effects. It also 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.

## 8.2 Legislation and Policy Framework

8.2.1 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** and supporting appendices, detail of which is 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. South East Lincolnshire Council (2019). South East Lincolnshire Local Plan 2011 – 2036 (Ref 2):
  - Policy 31 – Climate Change and Renewable and Low Carbon Energy: this requires projects to not create significant harm in relation to agricultural land take and the wider natural environment (which includes soils).

## 8.3 Scope of Assessment

8.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 3) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 4). 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 Agriculture and Soils 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**.

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

8.3.3 The scope of the construction, and operation and maintenance assessment covers the following receptor groups:

- i. Agricultural Land Classification (ALC), including best and most versatile (BMV) land;
- ii. Soil function; and
- iii. Agricultural landholdings.

## 8.4 Assessment Methodology

8.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Agriculture and Soils 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 described and assigned to the assessment. A summary of the key components is outlined below.

- 8.4.2 This preliminary assessment presented is supported by an initial collation and review of available baseline data. The data sources used to develop the baseline conditions are set out in section 8.5.
- 8.4.3 To fully inform the assessment of Agriculture and Soils, a detailed ALC and soil survey is being undertaken from January to October 2025 to determine the sensitivities of soils and the grades of agricultural land within Section 5. The information from the detailed ALC and soil survey was not available for this preliminary assessment but will inform the assessment presented in the ES. The survey and assessment will be undertaken in accordance with the Soil Survey Field Handbook (Ref 6) and the ALC guidelines (Ref 5). It will characterise soil properties based on an examination of soil profiles, from which agricultural land grade as well as soil resilience can be calculated and assessed. An Agriculture and Soils survey strategy document is provided within Annex II to the **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 8.4.4 The assessment presented in this PEI Report is based on publicly available Provisional ALC data, and detailed data (where available). The Provisional ALC mapping does not differentiate between Grade 3a (BMV) and Grade 3b (non-BMV); as such a worst-case approach has been taken for the assessment presented, with all land provisionally mapped as Grade 1, 2 and 3 being considered to comprise BMV land. The ES submitted with the DCO application will include detailed ALC survey data that will show the split between Grade 3a and 3b land. This information will further refine the assessment as presented in this Chapter for the ES. A Detailed ALC Survey Report will be included as an appendix within the ES.
- 8.4.5 To inform the assessment of impacts on farm holdings, broad data on agricultural landholdings will be collected through on-going discussions by the Project's Lands Team with landowner/occupiers or land agents. A preliminary overview of landowner/occupier information has been used to inform the preliminary assessment. This does not, for the PEI Report, include an assessment of individual landholdings in terms of viability (such as disruption or proportion of landholding taken temporarily or permanently). An assessment will be presented in the ES based on the level of further information gained and with a focus on the permanent impacts and on any land uses which may be considered more sensitive (such as orchards, high value cropping systems or livery stables). The assessment in relation to landholdings takes account of the framework associated with financial compensation for disruption and temporary/permanent loss of land (in accordance with the compensation code) which would include consideration of any active agri-environment and/or forestry/woodland schemes.
- 8.4.6 Land taken temporarily during construction, for example for construction compounds, would be reinstated following completion of construction activities. Land taken permanently during construction, for example for pylon foundations, would not be available for on-going agricultural use. Temporary and permanent impacts associated with land being taken are therefore addressed as part of the construction phase as the land is taken at that point in the Project.
- 8.4.7 Maintenance or repair works which would result in disturbance to soils during the operation of the Project (for example creation of temporary access routes and contractor compounds) would be undertaken in accordance with good practice soil handling methods. As these are likely to be small-scale and temporary, no likely

significant effects on agricultural land during operational, maintenance or repair activities are predicted. Whilst operational impacts are proposed to be scoped out of the assessment, the Scoping Opinion (Ref 3) requested further detail on the location and extent of access tracks and compounds for maintenance activities to demonstrate the limited extent/duration. Further information on the scale and duration of likely standard operational activities which could affect Agriculture and Soils will be provided in the ES.

## Assessment Assumptions and Limitations

- 8.4.8 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 8.4.9 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**. In addition to these, the following Section 5 specific Landscape assessment assumptions and limitations have been applied.
- 8.4.10 At this stage of the design development for Section 5 it is not possible to state the areas of land that will be affected, either temporarily or permanently, by the Project. As such the assessment presented in the PEI Report has been based on the Refined Siting Zone boundary as a worst case scenario.
- 8.4.11 It should be noted that while all land in Section 5 is provisionally mapped as ALC Grade 1 land, the land grades will be confirmed by detailed surveys and the final magnitude of effects will be presented based on the survey information and the detailed design. As BMV land comprises ALC Grades 1, 2 and 3a land, and provisional mapping has identified none of the lower grades within this Section, it is considered likely that predominantly BMV land will be affected within Section 5. Furthermore, provisional ALC mapping is at a scale of 1:250,000 and does not split Grade 3 into Grades 3a and 3b, which is critical for assessing impacts on BMV land. As such, for the purpose of the preliminary assessment all provisional ALC Grade 1, 2 and 3 land will be considered BMV land.
- 8.4.12 The key parameters and assumptions which inform the assessment 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 applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

## 8.5 Baseline Conditions

### Study Area

- 8.5.1 The Study Area for the assessment of Agriculture and Soils comprises the Refined Siting Zone boundary, as agreed within the Scoping Opinion (Ref 3). The assessment is confined to within this boundary as no land will be affected outside of this.

### Data Collection

- 8.5.2 The following data has been used to inform the baseline conditions:



- i. British Geological Survey (BGS) Geology Viewer (Ref 8);
- ii. Ordnance Survey (OS) mapping and aerial photography (Ref 9);
- iii. Department for Environment, Food and Rural Affairs (DEFRA) Agricultural Land Classification – Provisional (England), provided through MAGIC (Multi-Agency Geographic Information for the Countryside) (Ref 10);
- iv. Department for Environment, Food and Rural Affairs (DEFRA) Post-1988 Agricultural Land Classification (England), provided through MAGIC (Multi-Agency Geographic Information for the Countryside) (Ref 10);
- v. National Soil Association Map of East Midlands and Eastern England and soil data from National Soils Resources Institute at Cranfield university (NSRI) (Ref 11);
- vi. Likelihood of BMV Agricultural Land map (Ref 12);
- vii. Relevant Agriculture and Soils data from other projects which overlap with the draft Order Limits); and
- viii. Climate data sets for ALC assessment (Ref 13).

## Existing Baseline

8.5.3 The following section outlines the Agriculture and Soils baseline. The baseline section should be read in conjunction with the following supporting Figures as found within **PEI Report Volume 2**:

- i. **PEI Report Volume 2 Part B Section 5 Figure 8.1 National Soil Map;**
- ii. **PEI Report Volume 2 Part B Section 5 Figure 8.2 Provisional Agricultural Land Classification;**
- iii. **PEI Report Volume 2 Part B Section 5 Figure 8.3 Detailed Agricultural Land Classification;**
- iv. **PEI Report Volume 2 Part B Section 5 Figure 8.4 Woodland and Forestry Schemes;** and
- v. **PEI Report Volume 2 Part B Section 5 Figure 8.5 Agri-environment Schemes.**

## Geology

8.5.4 Geology plays a crucial role in shaping the soil types and characteristics as the parent material from which the soils are formed. Available geological mapping shows that the underlying bedrock geology present within Section 5 is the Oxford Clay Formation (mudstone). This is a sedimentary bedrock formed (between 166.1 and 157.3 million years ago) during the Jurassic period.

8.5.5 Clay and silt tidal flat deposits form the superficial drift present, which are sedimentary superficial deposits formed during the Quaternary period (between 11.8 thousand years ago and the present). The superficial deposit is found across the whole of Section 5.

## Soils

- 8.5.6 The Soil Associations describe the different types of soil found within the UK. Available national soil survey mapping data indicates that the Soil Association present within Section 5 (as shown in **PEI Report Volume 2 Part B Section 5 Figure 8.1 National Soil Map**) is the Wisbech Association.
- 8.5.7 The Wisbech Association comprises deep stoneless calcareous coarse silty soils. Groundwater is usually controlled by ditches or pumps as the land is flat with low ridges. There is a risk of wind erosion locally associated with these soils. They are seasonally waterlogged and affected by a shallow fluctuating groundwater-table. These soils are developed mainly within or over permeable material and have prominently mottled or greyish coloured horizons within 40 cm depth. The Wisbech Association is found across the entire section.
- 8.5.8 The soils in Section 5 will be providing a range of soil functions, and as such are considered to have a range of sensitivities from very high to medium.

## Agricultural Land Classification

- 8.5.9 ALC is a classification system used to assess the quality of agricultural land within England and Wales. The Provisional ALC mapping shows that Section 5 comprises Grade 1 land (excellent quality agricultural land). This is shown in **PEI Report Volume 2 Part B Section 5 Figure 8.2 Provisional Agricultural Land Classification**. This would be considered a receptor of very high sensitivity
- 8.5.10 Please note limitations associated with using provisional ALC mapping, as described in section 8.4.10.
- 8.5.11 There is no pre-existing detailed ALC survey data available for Section 5, as shown in **PEI Report Volume 2 Part B Section 5 Figure 8.3 Detailed Agricultural Land Classification**. Detailed ALC information is only available where a detailed ALC survey has previously been conducted and accepted by Natural England.

## Woodland and Forestry Scheme

- 8.5.12 Woodland and Forestry Schemes are government provided incentives that reward landowners for the creation and management of woodlands. The three Woodland Grant Schemes (WGSs) operated June 1988 – June 1991 (WGS1), June 1991 – September 1994 (WGS2), and October 1994 – June 2004 (WGS3). There is a WGS3 area within Section 5, west of Crown Farm (as shown on **PEI Report Volume 2 Part B Section 5 Figure 8.4 Woodland and Forestry Schemes**).

## Agri-Environment Schemes

- 8.5.13 Agri-environment Schemes comprise government funding to farmers and land managers to support activities which improve the local environment. There are different levels of Environmental Stewardship schemes which have increasing complexity and land management requirements but also therefore have greater environmental benefits. A Countryside Stewardship (Middle Tier) Scheme is found at Crown Farm within Section 5 as shown on **PEI Report Volume 2 Part Section 5 Figure 8.5 Agri Environment Schemes**.

## Land Use

- 8.5.14 Aerial imagery and OS mapping indicate that the agricultural land use within Section 5 is predominantly arable, with some grassland and woodland areas. Field boundaries are lined with hedges, trees and roads.

## Agricultural Landholdings

- 8.5.15 There are three landholdings identified within Section 5. Land use is predominantly arable with small sections of woodland and grassland. Given the predominant land use this receptor is considered to have a low sensitivity.

## Future Baseline

- 8.5.16 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 the construction of the Project.
- 8.5.17 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.
- 8.5.18 It is considered that the baseline conditions for soils and ALC grades will remain unchanged from those described in the baseline during the construction period of the Project. While there may be potential changes in relation to climate change, including greater rainfall intensity and frequency of droughts, that could affect soil conditions, land grade, and farming practices, it is likely that these would only become apparent over longer time frames.
- 8.5.19 There could potentially be future changes to land management practices and business approaches across the landowners/land managers irrespective of whether this Project goes ahead; these cannot be known or assessed currently as any future changes would be driven by third parties.
- 8.5.20 The baseline details as presented above are not anticipated to change in the absence of the Project.

## 8.6 Design, Control and Additional Mitigation Measures

### Design Mitigation Measures

- 8.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 15) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 16) which apply to the design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 17) and **PEI Report Volume 2**

**Part A Chapter 3 Main Alternatives Considered.** Principles include, but are not limited to, rationalising the design to minimise the land take required, 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 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.

## Control Mitigation Measures

### Construction

- 8.6.3 A Preliminary Outline Code of Construction Practice (CoCP) is provided in **PEI Report Volume 3 Appendix 5A Preliminary CoCP**. The control measures included within the Preliminary CoCP relevant to the Agriculture and Soils assessment of Section 5 include:

- i. GG01: The Project will be compliant with all relevant legislation, consents and permits.
- ii. GG02: The Project will be designed to comply with existing National Grid standards and the guidelines and policies detailed in NPS-EN5 including the International Commission on Non-Ionizing Radiation Protection guidelines for electric and magnetic fields (EMFs) and associated precautionary policy.
- iii. GG05: A record of condition will be carried out (photographic and descriptive) of the working areas that may be affected by the construction activities, prior to works commencing. This record will be available for comparison following reinstatement after the works have been completed to ensure that the standard of reinstatement at least meets that recorded in the pre-condition survey.
- iv. GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition (including ALC grade) and use. Hedgerows, fences, and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, in consultation with the landowner.
- v. 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.
- vi. GG19: Earthworks and stockpiled soil will be managed as per the Soil Management Plan (SMP).
- vii. AS01: Where land is being returned to agricultural use, the appropriate soil conditions (for example through the replacement of stripped layers and the removal of any compaction) will be recreated. This will be achieved to a depth of 1.2 m (or the maximum natural soil depth if this is shallower).

- viii. AS02: The intention is to maintain access where possible; this may have to be done using localised diversions/restrictions. Although not envisaged at this stage it may be that temporarily access isn't maintained but, in all instances, those impacted will be consulted on the proposals. This may require signed diversions or temporary restrictions to access. The means of access to affected properties, facilities and land parcels will be communicated to affected parties during the pre-construction period. with any changes communicated in advance of the change being implemented. Where field-to-field access points require alteration as a result of construction, alternative field access will be provided in consultation with the landowner/occupier.
- ix. AS03: Existing water supplies for livestock will be identified pre-construction. Where supplies will be lost or access compromised by construction works, temporary alternative supplies will be provided. Water supplies will be reinstated following construction.
- x. AS04: A scheme of pre-construction land drainage will be designed with the intent of maintaining the efficiency of the existing land drainage system and to assist in maintaining the integrity of the working area during construction. The Project may include a system of 'cut-off' drains which feed into a new header drain and the Project will also take into account surface water runoff measures.
- xi. AS05: Should animal bones be discovered during construction, which may indicate a potential burial site, works will cease, and advice will be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found.
- xii. AS06: All movement of plant and vehicles between fields will cease in the event of a notification by the Department for Environment, Food and Rural Affairs (Defra) of a disease outbreak in the vicinity of the site that requires the cessation of activities. Advice will be sought from Defra in order to develop suitable working methods required to reduce the biosecurity risk associated with the continuation of works.
- xiii. AS07: Stone pads or alternatives such as soil stabilisation will be installed in areas where heavy equipment, such as cranes and piling rigs, and access routes are to be used. The stone pads will provide stable working areas and will reduce disturbance to the ground. The stone pad area will be stripped of the topsoil, which will be stored and reinstated in accordance with the soil management measures.
- xiv. AS08: Soil management measures will be set out in the SMP. The SMP, will include, but not be limited to the following:
  - details of the soil resources present;
  - roles and responsibilities (and required competencies and training);
  - how topsoil and subsoil will be stripped and stockpiled;
  - suitable conditions for when handling soil will be undertaken, for example avoiding handling of waterlogged soil;
  - indicative soil storage locations;
  - how soil stockpiles will be designed taking into consideration site conditions and the nature/composition of the soil;

- specific measures for managing sensitive soils;
- suitable protective surfacing where soil stripping can be avoided, based on sensitivity of the environment and proposed works;
- approach to reinstating soil that has been compacted, where required;
- details of measures required for soil restoration; and
- requirements for monitoring.

## Additional Mitigation Measures

- 8.6.4 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.
- 8.6.5 Additional mitigation measures are not anticipated to be required in relation to Agriculture and Soil effects. However, this will remain under review during the completion of further assessment and development of 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, operational and/or maintenance activities within Section 5.
- 8.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described.
- 8.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this section in **Table 8.2**, 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

#### Agricultural Land Classification

- 8.7.5 To undertake this assessment, publicly available Provisional ALC data has been used to determine the likely presence of BMV. Land provisionally mapped as Grade 3 has been assumed to comprise BMV land. This approach has been taken at PEI Report stage as currently detailed ALC surveys have not been undertaken. The ES submitted with the DCO application will include detailed ALC survey data that will show the split between Grade 3a and Grade 3b land.

- 8.7.6 During construction there would be a potential loss of BMV land (defined as ALC Grades 1, 2 and 3a) from agricultural productivity.
- 8.7.7 It is assumed that all land within Section 5 may be temporarily impacted and temporarily removed from agricultural production during the construction phase. This is based on the requirement to secure land temporarily for both the construction of the substation(s) and associated infrastructure and the stringing of conductors between towers.
- 8.7.8 At this stage, the Study Area includes more land than will be required to construct and operate the Project. This area of land will be refined as the design matures. The siting area is characterised by land classified ALC Provisional Grade 1 (Excellent). Grade 1 land is considered to have a very high sensitivity.
- 8.7.9 Lincolnshire County is mapped as comprising 94.5 % BMV land. Given the abundance of BMV land within the County and the extent of Provisional Grade 1 land at and around the proposed substation location, opportunities for the preferential use of lower grade land will be very limited. The permanent loss of Provisional Grade 1 land, to facilitate the construction and operation of the substation(s), would result in a permanent significant adverse effect.

#### Soil Function

- 8.7.10 There would be disturbance to soils from the soil stripping required for pylon construction, access routes, and areas required temporarily (such as construction compounds and haul roads).
- 8.7.11 The soil within Section 5 is mapped as belonging to the Wisbech Association. Soils in this Association are categorised as being high sensitivity and having a low resilience to structural damage. The stripping and stockpiling of soil resources would have a temporary effect on the soil ecosystem services. This could include affecting soil hydrology as well as a soil's natural carbon storage ability. The implementation of effective soil handling, storage and reinstatement measures, which will be detailed in an SMP (submitted as part of the DCO application), would therefore be critical in ensuring minimisation of effects on these functions and the successful restoration and re-use of soils.
- 8.7.12 It is assumed that all land within Section 5 will be temporarily impacted by construction activities involving soil handling or trafficking, with soils temporarily affected reinstated to their pre-construction condition (as above, this is based on the requirement to secure land temporarily for both the construction of infrastructure and the stringing of conductors between towers).
- 8.7.13 The permanent loss of the soil would affect the associated soil ecosystem services. However, where practicable, the Project would seek to re-use surplus soil resources within the design, and depending on the proposed land use, some soil ecosystem services would be retained, restored, or potentially enhanced. Until it can be confirmed how practicable it would be to re-use the soil resources, it is considered that this would likely result in a significant adverse effect on soil function.
- 8.7.14 The land grades and soil types (including peat if present) affected permanently will be confirmed following surveys and will be fully assessed in the ES submitted with the DCO application.

## Operation and Maintenance

- 8.7.15 Based upon the preliminary assessment, no likely significant effects are expected to occur on Agriculture and Soil receptors during the operation and maintenance phase of the Project in Section 5. During the operation of the Project, land taken temporarily by the Project will have been reinstated and returned to agricultural use, whilst land taken permanently would no longer be for agricultural use and any likely significant effects accounted for during the construction phase assessment.

## Likely Non-Significant Effects

- 8.7.16 For completeness, **Table 8.2** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Agriculture and Soils effects.



Table 8.2 Preliminary summary of likely non-significant Agriculture and Soils effects – Section 5

Source	Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
<b>Construction Phase</b>						
Construction on agricultural land in use as part of an agricultural business	Agricultural Landholdings	Temporary loss of productive land	Low	Medium	Likely not significant	Land use is predominantly arable, and so of low sensitivity. Land required temporarily would be reinstated to its pre-construction condition and impacts on individual agricultural businesses would be dealt with through financial compensation in accordance with the compensation code (which would include consideration of any active agri-environment and/or forestry/woodland schemes).
<b>Operational and Maintenance Phases</b>						
Any operational activity on agricultural land for operational and maintenance purposes.	Agricultural Land Classification	Loss of BMV land from agricultural production due to activities required for operational and maintenance purposes.	Very high	Low/negligible	Likely not significant	Maintenance or repair works which would result in disturbance to BMV land during the operation of the Project (such as creation of access routes, use of trackway or creation of compounds) would be undertaken in accordance with good practice soil handling methods which would be set out in a Soil Management Plan for the works. As these are likely to be small-scale and temporary, no likely significant effects on BMV land during operational, maintenance or repair activities are predicted.
Impacts on soil function due to any activities	Soil Function	Disturbance to soils and loss of function due	Moderate	Low/negligible	Likely not significant	Maintenance or repair works which would result in disturbance to soils during the operation of the Project (such as creation of access routes, use of trackway or creation of compounds) would be

Source	Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
required for operational and maintenance purposes.		to activities required for operational and maintenance purposes.				undertaken in accordance with good practice soil handling methods which would be set out in a Soil Management Plan for the works. As these are likely to be small-scale and temporary, no likely significant effects on soil function during operational, maintenance or repair activities are predicted.
Impacts on agricultural business due to any activities required for operational and maintenance purposes.	Agricultural Landholdings	Temporary loss of productive land due to activities required for operational and maintenance purposes.	Low/negligible	Low/negligible	Likely not significant	Land use is predominantly arable, and so of low sensitivity. Land required temporarily would be reinstated to its pre-construction condition and impacts on individual agricultural businesses would be dealt with through financial compensation in accordance with the compensation code (which would include consideration of any active agri-environment and/or forestry/woodland schemes). The overhead line will not result in any further permanent impacts in relation to on-going agricultural activities above and beyond the permanent effects assessed during the construction phase, and any maintenance or repair works are likely to be small-scale and temporary, with works undertaken in accordance with good practice at the time of the works.

## **8.8 Monitoring**

- 8.8.1 Monitoring of soil handling, storage and reinstatement activities will be required during construction, and full details of what would be monitored, and the roles and responsibilities associated with the monitoring, will be set out in the Outline SMP (submitted as part of the DCO application).
- 8.8.2 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 and prior to any land hand back.

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- Ref 2 South East Lincolnshire Council (2019). South East Lincolnshire Local Plan 2011 – 2036. Available at: <https://southeastlinclslocalplan.org/article/20102/Adopted-Plan> [Accessed 12 January 2025].
- Ref 3 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 14 April 2025].
- Ref 4 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 14 April 2025].
- Ref 5 MAFF (1988). Agricultural Land Classification of England and Wales: Revised criteria for grading the quality of agricultural land (ALC011) [online]. Available at: <https://publications.naturalengland.org.uk/publication/6257050620264448>. [Accessed 29 April 2024].
- Ref 6 Hodgson, J.M. (2022). Soil Survey Field Handbook: Describing and Sampling Soil Profiles. Cranfield: Cranfield University.
- Ref 7 National Grid (2021) Construction best practice for underground cable installation.
- Ref 8 British Geological Survey, BGS Geology Viewer [online]. Available at: <https://www.bgs.ac.uk/map-viewers/bgs-geology-viewer/> [Accessed 3 May 2024].
- Ref 9 Google Earth (2024). Ordnance Survey Mapping and Aerial Photography [online]. Available at: <https://www.earth.google.com> [Accessed 29 April 2024].
- Ref 10 Defra, Magic Map Application [online]. Available at: <https://magic.defra.gov.uk/MagicMap.aspx> [Accessed 29 April 2024].
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- Ref 13 The Met Office (1989). Climatological Data for Agricultural Land Classification.
- Ref 14 Department for Energy Security and Net Zero (2023). National Policy Statement for electricity networks infrastructure (EN-5).

- Ref 15 National Grid (no date). Holford Rules [online]. Available at: <https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf>. [Accessed 30 August 2024].
- Ref 16 National Grid (no date). Horlock Rules [online]. Available at: <https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf>. [Accessed 30 August 2024].
- Ref 17 Grimsby to Walpole Corridor Preliminary Routeing and Siting Study. January 2024 [online]. Available at: <https://www.nationalgrid.com/document/352621/download> [Accessed 18 September 2024].

# 9. Traffic and Movement

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# 9. Traffic and Movement

## 9.1 Introduction

- 9.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Traffic and Movement assessment for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 9.1.2 The assessment for Section 5 is based on a Refined Siting Zone boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 9.1.3 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 Traffic and Movement 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 Traffic and Movement assessment within the Section 5 (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 Section 5 Study Area relevant to the Traffic and Movement assessment (section 9.5);
  - vi. A description of mitigation measures included for the purposes of the Traffic and Movement assessment reported within the 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 significant and non-significant Traffic and Movement effects arising during construction and operation of the Project within the Section 5 Study Area, based upon the assessment completed to date (section 9.7); and



viii. An outline of the likely monitoring requirements in relation to Traffic and Movement (section 9.8).

9.1.4 Further supporting information is set out in Table 9.1 below, including supporting figures and technical appendices.

Table 9.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 9.1 Overall Context Plan</b> <b>Figure 9.2 Primary Access Routes and Worker Access Routes</b> <b>Figure 9.3 Existing Public Rights of Way (PRoW)</b> <b>Figure 9.4 Route Sensitivity</b> <b>Figure 9.5 Preliminary Impact Analysis</b>
<b>PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline</b>	Presents baseline traffic information for key highway links including type of link, traffic flows, congestion rating, collision clusters and sensitive receptors.
<b>PEI Report Volume 3 Part B Sections 1-7 Appendix 9B Preliminary Construction Information</b>	Provides preliminary construction traffic information for the substation(s), compounds and bellmouths providing access to the construction haul routes. This includes construction Heavy Goods Vehicles (HGVs) and construction staff traffic flows.
<b>PEI Report Volume 3 Part B Sections 1-7 Appendix 9C Future Baseline and Impact Analysis</b>	Presents the traffic analysis, including calculated future baseline and forecast construction traffic flows, to determine the likely percentage change in traffic flows on key highway links as a result of the Project. This is used to determine whether the impact (change) meets the threshold for more detailed assessment based on the sensitivity of the links.
<b>Project Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft

Supporting Information	Description
	Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 9.1.5 There are interrelationships between the potential effects on Traffic and Movement 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 5 Chapter 10 Noise and Vibration** considers the noise and vibration impacts of changes in traffic flow on those road links utilised by traffic generated by the Project.
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 11 Socio-economics, Recreation and Tourism** considers potential in-combination effects to users of promoted/recreational routes including PRoW.

- iii. **PEI Report Volume 2 Part B Section 5 Chapter 12 Air Quality** considers the air quality impacts of changes in traffic flow on those road links utilised by traffic generated by the Project, including vehicle emissions and dust (trackout).
- iv. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
- v. **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing** considers potential impacts on neighbourhood quality and access to open space and health and social infrastructure, including those associated with traffic generated by the Project.
- vi. **PEI Report Volume 2 Part C Route-wide Chapter 9 Climate Change** considers the potential greenhouse gas emissions from traffic resulting from the Project. It should be noted that at this preliminary stage, this does not include quantitative calculations.
- vii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.

## 9.2 Legislation and Policy Framework

### Legislation and National Policy

- 9.2.1 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** and supporting appendices, detail of which is 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. Lincolnshire County Council's Local Transport Plan 5 (Adopted 2022) (Ref 1);
    - Aims to use the local and strategic development management processes to ensure that development is planned, delivered and managed to reduce the need to travel and to support the delivery of sustainable transport modes. Supports the provision of improved walking, cycling and public transport services and facilities as part of new development and actively encourage innovative solutions to travel.
  - ii. Central Lincolnshire Local Plan (Adopted April 2023)<sup>1</sup> (Ref 2):

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<sup>1</sup> Construction traffic routes anticipated to be utilised by construction traffic associated with works in Section 5 include highway links across the wider region, therefore policies set out within the Central Lincolnshire Local Plan are also considered relevant to the assessment.

- Policy S47 Accessibility and Transport: sets out the requirements for an efficient and safe transport network, inclusive of strategic and public community transport infrastructure and services; and
  - Policy S48 Walking and Cycling Infrastructure: requires existing and new active travel infrastructure to be protected, maintained and improved.
- iii. South East Lincolnshire Local Plan 2011-2036 (Adopted March 2019) (Ref 3):
- Policy 33 Delivering a More Sustainable Transport Network: seeks improvements to existing transport infrastructure and services and encourages the protection of existing footpaths, cycle routes and PRow from development; and
  - Policy 34 Delivering the Boston Distributor Road: Priority strategic infrastructure – development that compromises identified priority strategic infrastructure will not be permitted.
- iv. Boston Transport Strategy 2016-2036 (Ref 4):
- The Strategy helps to address existing transport and travel issues in Boston and help support proposals for significant growth in the short, medium and long term. The Strategy includes support for development of the Boston Distributor Road.
- v. Spalding Transport Strategy 2018-2036 (Ref 5);
- The Strategy provides an approach to the improvement and provision of transport and access for the town and surrounding area. The Strategy addresses existing issues and supports proposals for significant growth in the town in the short, medium and long term. The Strategy covers provision of improved and sustainable transport policy, services and infrastructure

## 9.3 Scope of Assessment

- 9.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 6) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 7). 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 Traffic and Movement 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**.
- 9.3.2 Non statutory consultation feedback has been addressed within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.
- 9.3.3 The scope of the construction assessment considers potential effects upon a range of receptor groups in accordance with Institute of Environmental Management and Assessment (IEMA) Guidance (Ref 8) which is based on consideration of the impacts upon the following transport infrastructure: highways (including footpaths and cycleways), railways, waterways and Public Rights of Way (PRow) and promoted/recreational routes. The receptors assessed and potential effects considered are summarised in Table 9.2.

Table 9.2 Scope of Traffic and Movement assessment

<b>Receptor</b>	<b>Potential effects</b>
<b>Highway Network (including footways and cycleways)</b>	
Road users	Effects as a result of construction traffic and road closures/diversions leading to potential severance, driver delay and highway safety effects. Effects as a result of the movement of Abnormal Indivisible Loads (AIL) and hazardous loads during construction.
Public transport users (bus)	Effects as a result of construction traffic and road closures/diversions leading to potential journey time delays.
Pedestrians and cyclists	Effects as a result of construction traffic leading to severance and pedestrian/cycle delay. Effects on footway closures/diversions leading to severance and/or increased journey time. Effects of general construction works leading to a decline in pedestrian and cycle amenity <sup>2</sup> and additional fear and intimidation.
<b>Railways</b>	
Railway users	Effects upon users of the rail network due to potential impacts upon railway infrastructure.
<b>Navigable Waterways</b>	
Waterway users	Effects upon users of navigable waterways due to temporary closures leading to reduced access/increased journey time.
<b>Public Rights of Way and Promoted/Recreational Routes</b>	
Pedestrians, Cyclists and Equestrians	Effects as a result of route closures/diversions leading to potential increased journey time. Effects due to a decline in pedestrian and cycle amenity due to interaction with traffic.

9.3.4 The EIA Scoping Report Traffic and Movement chapter sought to scope out effects associated with the operation of the Project, however it is noted that the Scoping Opinion received requested further information relating to operational traffic to support this position. This PEI Report and supporting Appendices therefore provides an initial assessment of potential effects during operation. The scope of the operational assessment also considers potential effects on users of PRoW and promoted/recreational routes, i.e. pedestrians, cyclists and equestrians.

<sup>2</sup> Pedestrian amenity is broadly defined as the relative pleasantness of a journey and is considered to be affected by traffic flow, composition and pavement width/separation from traffic.

## 9.4 Assessment Methodology

- 9.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Traffic and Movement 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 described and assigned to the assessment. A summary of the key components is outlined below.
- 9.4.2 The IEMA Guidance assesses the effect on users by assessing the transport infrastructure upon which they rely.
- 9.4.3 For users of the highway network during construction, the assessment is based on the impact criteria set out within the IEMA Guidance, which sets out two broad rules for identifying potential highway links for analysis:
- i. Rule 1: include highway links where traffic flows will increase by more than 30 per cent (or the number of HGVs will increase by more than 30 per cent); and
  - ii. Rule 2: include highway links of high sensitivity where traffic flows have increased by 10 per cent or more.
- 9.4.4 Based on the IEMA Guidance, highway links have therefore been identified where traffic flows are expected to increase by 30 per cent or more, and where there are increases of 10 per cent or more in an area identified as high or very high sensitivity. Sensitive areas are those where there is a presence of sensitive receptors as defined by the IEMA Guidance, and are also defined through consideration of congestion and accident data.
- 9.4.5 To determine likely increases in traffic flows on highway links, projected volumes of construction traffic have been distributed across the road network. Construction traffic has been assigned based upon an assessment of the connection points between the works areas and the highway network, and the most suitable/likely routes that will be used to access the draft Order Limits. This approach is based upon identification of bellmouths, Primary Access Routes and Worker Access Routes, which are defined in Table 9.3 and described further in section 9.5 Baseline Conditions.

Table 9.3 Distribution of Project traffic – definitions

Accesses used by Project traffic	Definition
Bellmouths	Access points (junctions) from the existing highway network, facilitating access to construction compounds and site haul roads.
Primary Access Routes	Identified as a series of roads and junctions between the Strategic Road Network (SRN) <sup>3</sup> and the bellmouths, suitable for access by large construction vehicles, that are planned to be used by HGVs. Identification of these routes is based on existing

<sup>3</sup> The Strategic Road Network is the national network of motorways and major A roads maintained and operated by National Highways

Accesses used by Project traffic	Definition
	conditions, potential for improvements and professional judgement.
Worker Access Routes	Identified as a series of additional roads and junctions which are not promoted as construction HGVs routes but which could be used by workers to travel to site. These are identified as likely routes between residential areas, key employment/skills centres and the bellmouths.

- 9.4.6 A qualitative assessment of impacts to bus users during construction has been undertaken based on the projected increase in traffic flows as a result of the Project and potential impacts to bus services. More detailed assessment will be provided within the ES if the projected increase in traffic flows on the highway links where bus services operate exceed the IEMA Guidance screening criteria defined above.
- 9.4.7 A qualitative assessment of impacts to railway users and waterway users during construction has been undertaken based on any identified requirement to restrict access or close these routes to enable construction of the Project within Section 5. An initial assessment of sensitivity is based on consideration of the likely numbers of users of the infrastructure; for railways this is considered High as there are likely to be high numbers of passengers, for waterways this is considered Low as the number of users will likely be less. More detailed assessment, where required, will be provided in the ES following further consultation with the infrastructure operators.
- 9.4.8 A qualitative assessment of impacts to pedestrians and cyclists has been undertaken based on the projected increase in traffic flows as a result of the Project during construction, and potential impacts upon pedestrians and cyclists using the affected highway routes. More detailed assessment will be provided in the ES where the projected increase in traffic flows exceed the IEMA Guidance criteria and the impact thresholds defined with the Scoping Report or if required by the highway authority.
- 9.4.9 In addition, PRoW and promoted/recreational routes that are expected to be crossed by works within Section 5 have been identified and qualitative assessment of impacts to pedestrians, cyclists and equestrians undertaken where routes are anticipated to require temporary diversion or closure. The significance of effects on PRoW and promoted/recreational routes is determined through professional judgement based on the sensitivity (national, regional, local importance and potential usage of the routes) and magnitude of impact based on requirement for crossing, diversion or closures of routes. More details assessment will be provided within the ES where requested by the local authority.
- 9.4.10 A high-level summary of potential effects (without mitigation) is then provided within this chapter based on professional judgement and experience on other similar National Grid Electricity Transmission plc (National Grid) projects. Residual effects will be assessed and reported in the ES.
- 9.4.11 While the Scoping Report Traffic and Movement chapter sought to scope out effects associated with the operation of the Project, this PEI Report assessment presents details of forecast operational traffic movements and provides an initial assessment of potential effects of the forecast flows on baseline flows.

## Assessment Assumptions and Limitations

- 9.4.12 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 9.4.13 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**.
- 9.4.14 In addition to these, an estimate of construction and operational traffic flows has been made based on general materials/equipment and staff/construction worker assumptions made for other Section substations within the Project. This gives a reasonable forecast of potential traffic flows at this preliminary stage.
- 9.4.15 These key parameters and assumptions which inform the assessment 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.

## 9.5 Baseline Conditions

### Study Area

- 9.5.1 The Traffic and Movement Study Area for Section 5 comprises highway links assumed to be used to provide access for construction vehicles and considers the impacts to traffic, bus routes and pedestrian/cycle routes along these highway access routes. The Study Area for Construction Traffic Routes is defined in further detail below.
- 9.5.2 The Study Area also includes pedestrian/cycle/equestrian routes and PRoW networks, as well as railways and waterways that are crossed by the Refined Siting Zone.
- 9.5.3 **PEI Report Volume 2 Part B Section 5 Figure 9.1 Overall Context Plan** provides the wider Project context showing the SRN and main A roads that provide access to all Sections of the Project. The access routes and proposed Section 5 Study Area are shown in **PEI Report Volume 2 Part B Section 5 Figure 9.2 Primary Access Routes and Workers Access Routes**.

### Construction Traffic Routes - HGVs

- 9.5.4 Initial construction information (including construction traffic, compound locations, bellmouth accesses and haul routes) has been used to determine the Primary Access Routes which form the basis of the initial assessment presented in this PEI Report. Primary Access Routes have been developed using the following criteria where possible:
- i. Construction traffic would access site bellmouths via the Primary Access Routes along the local road network. The Primary Access Routes would then connect to an appropriate close junction with the SRN and/or classified road network. Whilst it is acknowledged that the SRN is part of the classified road network, the report makes a distinction between the two because of the capacity of the SRN to carry trunk road traffic and abnormal loads.



- ii. From the site bellmouths, construction vehicles would be routed off the public highway along haul roads to access the construction compounds and construction areas. Haul roads will be temporary in nature and will be reinstated upon completion of the construction phase. Haul routes and permanent access roads are illustrated on **PEI Report Volume 2 Part B Section 5 Figure 1.2 Temporary and Construction Features** and **Figure 1.3 Permanent and Operational Features** respectively.
- iii. Shorter available routes between the SRN and classified road network and site access bellmouths have been selected where possible, balancing distance and the suitability of links to accommodate construction traffic.
- iv. Existing known highway constraints, such as road geometry, height and weight restrictions, junction arrangements and other physical constraints have been avoided where possible.
- v. Settlements and sensitive locations such as schools or hospitals have been avoided where possible to reduce potential effects on receptors.

9.5.5 Table 9.4 provides a summary of the SRN and classified road network that would be used by construction traffic accessing the Section 5, and their strategic connections for delivery of materials/equipment.

Table 9.4 Construction traffic routes – SRN connections

Strategic/classified road network	SRN Connections
A17	North and west to A15 and A1(M)
A47	West to A1(M) and M1

9.5.6 Primary Access Routes are formed of one or more roads within the road network between the SRN/classified road network and the site access bellmouths. The Primary Access Routes are made up of Core Routes (CR series), which are the main A roads providing connections across the wider Study Area, and Local Links (LK series) which are roads providing local access from the Core Routes to the individual bellmouth accesses.

9.5.7 These are summarised in Table 9.5 and presented on **PEI Report Volume 2 Part B Section 5 Figure 9.2 Primary Access Routes and Worker Access Routes**. Further details of the roads forming the Primary Access Routes are presented in **PEI Report Volume 3 Part B Section 5 Appendix 9A Traffic and Movement Baseline**.

Table 9.5 Primary Access Routes for HGVs

Access	Core Routes forming Primary Access Routes	Local Links forming Primary Access Routes
Refined Siting Zone	CR15 A17 / CR14 A17 / CR11 A16 or CR27 A47 / CR12 A16 / CR11	LK79 A151 / LK86 A151 / LK87 A151 / LK66 Stone Gate / LK65 Marsh Road

## Construction Traffic Routes – Worker Access Routes

- 9.5.8 In addition to the Primary Access Routes, construction workers cars/light goods vehicles (LGVs) are also likely to use the wider highway network, including various links which are not planned to be used by HGVs to access the site. Therefore, additional access routes have been identified that construction workers are expected to use (W series), which provide access from local urban areas where workers are assumed to live.
- 9.5.9 Table 9.6 summarises the main construction Worker Access Routes relevant to Section 5. These are presented on **PEI Report Volume 2 Part B Section 5 Figure 9.2 Primary Access Routes and Worker Access Routes**.

Table 9.6 Worker Access Routes – Additional Highways for Construction Workers

Access Ref	Roads forming Worker Access Routes
Weston Marsh Substation and compound	CR9 (A16), CR10 (A16), CR13 (A47), CR22 (A17), CR23 (A1101), CR28 (A17), LK71 (B1165), LK90 (B1165), W40 (Marsh Road), W41 (A151), W42 (A151), W43 (East Gate), W44 (A1175), W45 (Eaugate Bank/Randall Bank), W46 (A52), W47 (Quadring Road), W48 (A151), W49 (A151), W50 (A17), W51 (A17), W60 (Fulney Drove), W61 (Eye Road), W62 (A1139), W63 (A1101), W64 (A1101)

## Data Collection

- 9.5.10 The following data has been used to inform the baseline conditions:
- i. highway network – Ordnance Survey open map (Ref 9), Google Maps (Ref 10), OpenStreetBrowser (Ref 11);
  - ii. bus route information – local bus operators, traveline.info (Ref 12), Google Maps (Ref 10);
  - iii. rail information – National Rail (Ref 13), Google Maps (Ref 10);
  - iv. waterways – Environment Agency, Navigation Authority and The Inland Waterways Association (Ref 14);
  - v. designated non-motorised user routes for pedestrians, cyclists and equestrians and PRow – Sustrans (Ref 15) Local Authority Definitive/PRow map(s);
  - vi. Other promoted/recreational routes for pedestrians obtained from the Long Distance Walkers Association and through stakeholder engagement undertaken to date;
  - vii. Annual Average Daily Traffic (AADT) flows obtained from the Department for Transport (DfT) traffic count data (Ref 16);
  - viii. traffic count data from surveys undertaken for the Project – the surveys record road users, pedestrians, cyclists and equestrians as required with Automatic Traffic Count (ATC) data/PRow count data collected in August 2024 and October 2024;
  - ix. Traffic Regulation Orders restricting movement and constraints such as height and weight restrictions as viewed on Google Maps;

- x. Personal Injury Collision (PIC) DfT accident data over a five year period (Ref 17);
- xi. Traffic growth factors have been obtained from the Trip End Model Presentation Program (TEMPPro)/National Trip End Model; and
- xii. Identification of pedestrian, cycle and horse-riding infrastructure provision along the Primary Access Routes, obtained from Google Maps imagery of the highway network.

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

- i. traffic and PRow user survey data has been obtained for August 2024 and October 2024, additional surveys will be undertaken in 2025 to understand baseline conditions;
- ii. traffic information on other developments (committed) within the Study Area received from relevant planning authorities;
- iii. committed transport schemes along and in vicinity of the Primary Access Routes; and
- iv. construction and operational traffic flows for Eastern Green Link 3 and 4 projects for cumulative sensitivity testing.

## Existing Baseline

9.5.12 The following section outlines the Traffic and Movement baseline. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:

- i. **PEI Report Volume 2 Part B Section 5 Figure 9.1 Overall Context Plan;**
- ii. **PEI Report Volume 2 Part B Section 5 Figure 9.2 Primary Access Routes and Worker Access Routes;**
- iii. **PEI Report Volume 2 Part B Section 5 Figure 9.3 Existing Public Rights of Way (PROW); and**
- iv. **PEI Report Volume 2 Part B Section 5 Figure 9.4 Route Sensitivity; and**
- v. **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline.**

## Highway Network

9.5.13 Links forming Primary Access Routes and Worker Access Routes and the description of the road network along each route can be found within **PEI Report Volume 3 Part B Section 5 Appendix 9A Traffic and Movement Baseline.**

9.5.14 Table 9.7 provides a description of each link which forms part of the Primary Access Routes and Worker Access Routes within the Section 5 Study Area, including the type of carriageway, character, speed limits, highway constraints, presence of street lighting, bus routes, on-carriageway parking, and pedestrian, equestrian and cycle provision. These highway links are presented on **PEI Report Volume 2 Part B Section 5 Figure 9.2 Primary Access Routes and Worker Access Routes.**

Table 9.7 Highway network – links

Route Ref	Highway Link	Description
CR9	A16	Generally wide single carriageway, predominantly rural, 50mph / 60mph speed limit, no street lighting or footways. Some small residential areas (Sibsey, Littlemoor, Stickney, East Keal, Spilsby), with 30/40mph, street lighting and footways in these areas. Crosses rail line at level crossing in High Ferry. Southern section passes through central Boston where John Adams Way is dual carriageway with 40mph speed limit, footways and street lighting
CR10	A16	Generally wide single carriageway, predominantly rural, 60mph speed limit, no street lighting or footways, speed limit reduces and street lighting provided through Kirton and southern Boston where 40mph applies and some sections of footway and segregated cycleways are provided
CR11	A16	Wide single carriageway, rural area, national speed limit applies (60mph), no footways or street lighting
CR12	A16	Wide single carriageway, generally national speed limit (60mph), generally no street lighting except at junctions, no footways
CR13	A47	Wide single carriageway / dual carriageway road, national speed limit (60/70mph), generally no street lighting except at junctions, no footways
CR14	A17	Wide single carriageway with localised widening at junctions and some sections of dual carriageway, predominantly rural, national speed limit, no street lighting, except at junctions, no footways
CR15	A17	Dual carriageway, generally rural route, national speed limit (70mph), no footways or street lighting to the north and east of Sleaford. Narrows to wide single carriageway 3km east of Sleaford, national speed limit (60mph), no footways or street lighting, localised widening and lighting at some junctions. Speed limit reduces to 50mph with narrow footway, refuge crossings at East Heckington and Swineshead Bridge
CR22	A17	Wide single carriageway with some short sections of dual carriageway, national speed limit (60/70mph), no footways, generally no street lighting except at junctions
CR23	A1101	Single carriageway, national speed limit, no lighting or footways
CR27	A47	Dual carriageway road, national speed limit (70mph), street lighting, no footways
CR28	A17	Wide single carriageway with some short sections of dual carriageway at junctions, national speed limit (60mph), no footways, generally no street lighting except at junctions

<b>Route Ref</b>	<b>Highway Link</b>	<b>Description</b>
LK65	Marsh Road	Narrow single carriageway, national speed limit (60mph), no footways or street lighting
LK66	Stone Gate	Narrow single carriageway, national speed limit (60mph), no footways or street lighting
LK71	B1165 Ravens Bank	Single carriageway, generally national speed limit (60mph), no footways or street lighting
LK79	A151	Wide single carriageway, 40mph speed limit, narrow shared footway/cycleway, bus stops on street, street lighting western end
LK86	A151	Wide single carriageway, national speed limit (60mph), no footways or street lighting
LK87	A151	Wide single carriageway, national speed limit (60mph), no footways or street lighting
LK90	B1165 Ravens Bank	Single carriageway, generally national speed limit (60mph), no footways or street lighting
W40	Marsh Road	Narrow single carriageway, 60mph speed limit, no footways or street lighting, low bridge under A16
W41	A151	Wide single carriageway, 30/50mph speed limit through urban areas, 60mph speed limit in rural area, footways and street lighting generally provided, bus route with on carriageway bus stops
W42	A151	Wide single carriageway, 50/60mph speed limit, footways and street lighting generally provided in Holbeach but not on rural stretch to the north, bus route with on carriageway bus stops
W43	East Gate	Narrow single carriageway, 60mph speed limit, no footways or street lighting
W44	A1175 Littleworth Drove	Wide single carriageway, 50/60mph speed limit, street lighting and narrow footway on one side, bus route
W45	Eaugate Bank / Randall Bank	Narrow single carriageway, 60mph speed limit, no footways or street lighting
W46	A52	Wide single carriageway, 60mph limit, no footways or street lighting
W47	Quadring Road	Wide single carriageway, 30mph speed limit, footways, street lighting and bus route in Donington, Quadring and Gosberton, 50mph speed limit in rural areas, no footways or street lighting
W48	A151 Bourne Road/ Dozens Bank	Wide single carriageway, 60mph speed limit, no street lighting or footways

Route Ref	Highway Link	Description
W49	A151 Bourne Road	Wide single carriageway through urban area, 40mph speed limit in semi-rural area and 30mph speed limit within the urban conurbation of Spalding, street lighting and footways
W50	A17	Wide single carriageway, 60mph speed limit, no footways, no street lighting except at junctions near Sutton Bridge
W51	A17	Wide single carriageway, 60mph speed limit, no footways or street lighting
W60	Fulney Drove	Single carriageway, 60mph speed limit, no footways or street lighting
W61	Eye Road	Wide single carriageway, 60mph speed limit, narrow footway
W62	A1139 Frank Perkins Parkway	Dual carriageway, 70mph speed limit, no street lighting or footways
W63	A1101 Sutton Road	Wide single carriageway, 50mph speed limit, no street lighting or footways
W64	A1101 Churchill Road	Wide single carriageway / dual carriageway in parts, urban route, 30/40mph speed limit, street lighting and footways, bus route with bus stops on carriage

9.5.15 For the PEI Report no assessment of junction impacts along the Primary Access Routes and Worker Access Routes has been undertaken. However, the baseline review of link congestion and accident data provided in **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline** does consider junctions as part of the route sensitivity. More detailed assessment of junction operation will be undertaken as required and presented with the Transport Assessment and ES to be submitted with the DCO application.

9.5.16 In addition to the Primary Access Routes and Worker Access Routes, there are roads located on the local highway network where a crossover point is proposed to be provided. This allows construction vehicles to cross over the road (likely via a priority crossing arrangement) and progress along the proposed haul roads. Construction traffic will not access the local highway at these points, therefore these roads have not been assessed within this PEI Report. These cross over points are listed within **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline**.

### Traffic Flows

9.5.17 Where available, baseline traffic flows are taken from the DfT's traffic counters for road links forming the Primary Access Routes and Worker Access Routes. The DfT traffic counter sites are shown on **PEI Report Volume 2 Part B Section 5 Figure 9.2 Primary Access Routes and Worker Access Routes**.

9.5.18 Traffic surveys were undertaken in August and October 2024 on links that do not have available or recent DfT counts. The location of the traffic surveys are also

shown on **PEI Report Volume 2 Part B Section 5 Figure 9.2 Primary Access Routes and Worker Access Routes**.

- 9.5.19 Appropriate growth factors derived from the DfT's Trip End Model Presentation Program (TEMPro), which is used for viewing the National Trip End Model information, have been applied to the count data where required to present all traffic data for a consistent 2024 Base Year.
- 9.5.20 Baseline traffic flows on road links forming the Primary Access Routes and Worker Access Routes where surveys have been undertaken are presented in **PEI Report Volume 3 Part B Section 5 Appendix 9B Traffic and Movement Baseline**. All traffic data is presented as Annual Average Daily Traffic (AADT) flows for all traffic and for HGVs.
- 9.5.21 In addition, a congestion rating is set out within **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline** and presented on **PEI Report Volume 2 Part B Section 5 Figure 9.4: Route Sensitivity**. This is based on a review of google traffic flow categories for typical weekday peak hours; coloured grading of fast to slow represented as green = 0, orange = 1, red = 2, dark red = 3. Congestion along the whole link has been considered and where congestion varies along the link or over different time periods a judgement has been made for the overall link rating.

#### Collision Data

- 9.5.22 Personal injury collision (PIC) data has been obtained from DfT Road Safety Data for the roads along the Primary Access Routes and Worker Access Routes. The latest five-year PIC data (2019-2023) is presented on **PEI Report Volume 2 Part B Section 5 Figure 9.4 Route Sensitivity**.
- 9.5.23 A collision cluster has been determined by the following criteria:
- i. a location where there are nine or more injury collisions occurring within a junction or a 100 m stretch; and
  - ii. a location with four or more fatal and/or serious collisions happening either within a junction or within a 100 m stretch.
- 9.5.24 From the collision data analysis, collision clusters have been identified at the following locations:
- i. At the A16 / South Square / South End, A16 / High Street and A16 / A52 junctions in Boston;
  - ii. At the A16 / B1397 and A16 / B1192 roundabouts in southern Boston;
  - iii. At the A16 / A17 roundabout (Sutterton roundabout);
  - iv. At the A47 / A1101 roundabout (Elm Road Junction);
  - v. At the A15 / A47 roundabout to the north of Peterborough; and
  - vi. At the Frank Perkins Parkway / Eye Road / A15 roundabout to the east of Peterborough

## Highway Link Sensitivity

- 9.5.25 Sensitive receptors include users of highway links including drivers, walkers, cyclists, horse riders and public transport passengers. Sensitive areas comprise urban areas where there are likely to be more people (including vulnerable users, younger, older, socially disadvantaged people) and include residential properties, retail areas, schools and hospitals.
- 9.5.26 Receptor/area sensitivity has been assigned to all assessed highway links which constitute the Primary Access Routes and Workers Access Routes for Section 5. The sensitivity level follows IEMA guidance and is categorised as Negligible, Low, Medium, High and Very High. Sensitivity of a link has been determined based on the identified receptors which are present, alongside the assessment of each highway link's congestion rating and any associated collision clusters. Further detail is included in **PEI Report Volume 3 Part A Appendix 4B EIA Assessment Methodologies and Scope**.
- 9.5.27 A description, location, and the sensitivity level within the Section 5 Study Area are summarised in Table 9.8 below and **PEI Report Volume 3 Part B Sections 1-7 Appendix 9A Traffic and Movement Baseline** and presented on **PEI Report Volume 2 Part B Section 5 Figure 9.4 Route Sensitivity**.

Table 9.8 Highway link sensitivity

Route Ref	Highway Link	Description	Sensitivity Level
CR9	A16	Route passes through some small settlements to north- residential and commercial properties with some frontages / direct accesses. Schools in Sibsey and Stickney. Sections of footway, bus route. Through central Boston - residential and commercial properties with some frontages / direct accesses. Hospital to north of Boston. Footway adjacent to carriageway, bus route	High
CR10	A16	Few properties through rural area. Some residential and commercial properties in Boston though generally not with direct frontages / accesses, some segregated footway/cycleways, some footways adjacent to the carriageway and pedestrian crossings	Medium
CR11	A16	A few commercial properties along this link	Low
CR12	A16	Very occasional properties along this link	Low
CR13	A47	A few residential and commercial properties along this link	Low
CR14	A17	A few commercial and residential properties along this link	Low
CR15	A17	A few residential and commercial properties along this link	Low



<b>Route Ref</b>	<b>Highway Link</b>	<b>Description</b>	<b>Sensitivity Level</b>
CR22	A17	Very occasional properties along this link	Low
CR23	A1101	A few residential and commercial properties along this link	Low
CR27	A47	No receptors identified along this link	Negligible
CR28	A17	No receptors identified along this link	Negligible
LK65	Marsh Road	A few residential and commercial properties along this link	Low
LK66	Stone Gate	A few residential and commercial properties along this link	Low
LK71	B1165 Ravens Bank	Very occasional properties along this link	Low
LK79	A151	A few, generally commercial properties, on street bus stops, segregated pedestrian/cycleway adjacent to carriageway	Medium
LK86	A151	No receptors identified along this link	Negligible
LK87	A151	No receptors identified along this link	Negligible
LK90	B1165 Ravens Bank	A few residential properties, short section of PRow runs along the road	Low
W40	Marsh Road	A few residential properties along this link	Low
W41	A151	Residential and commercial properties, bus route	Medium
W42	A151	A few residential and commercial properties, bus route	Low
W43	East Gate	A few residential properties along this link	Low
W44	A1175 Littleworth Drove	A few residential properties along this link	Low
W45	Eaugate Bank / Randall Bank	Occasional residential properties along this link	Low
W46	A52	Occasional residential properties along this link	Low
W47	Quadring Road	Residential and commercial properties, driveways and some on street parking, bus route in urban areas, primary school	High
W48	A151 Bourne Road/ Dozens Bank	A few residential properties along this link	Low

Route Ref	Highway Link	Description	Sensitivity Level
W49	A151 Bourne Road	Multiple residential and commercial properties in Spalding, direct accesses and on street parking, bus route	High
W50	A17	A few commercial properties in Sutton Bridge	Low
W51	A17	Bus stops with laybys and footway connection to Sutton Bridge	Low
W60	Fulney Drove	A few residential and commercial properties along this link	Low
W61	Eye Road	Some commercial properties along this link	Low
W62	A1139 Frank Perkins Parkway	No receptors identified along this link	Negligible
W63	A1101 Sutton Road	Some commercial properties along this link	Low
W64	A1101 Churchill Road	Busy urban area, residential and commercial properties, bus route in Wisbech	High

### Bus Routes

9.5.28 Bus services run along some roads forming the Primary Access Routes and Worker Access Routes for Section 5. A number of services run through central Boston and Spalding providing access to a range of local and regional destinations. In the immediate vicinity of the Refined Siting Zone, Service 505 provides approximately two services per hour between Kings Lynn/Sutton Bridge and Spalding. Bus stops are located on the A151 and in Weston to the south of the Refined Siting Zone.

### Railway Infrastructure

9.5.29 The nearest rail station is at Spalding, which is a stop for regular services to Peterborough, Lincoln, Newark Northgate and Doncaster. Spalding Railway Station is some distance from the Refined Siting Zone, approximately 5km to the south west. The Primary Access Routes for construction HGV traffic do not pass the station, although some construction workers cars/LGVs may travel through central Spalding close to the Station. No rail lines are crossed by the Refined Siting Zone.

### Waterways

9.5.30 The Refined Siting Zone crosses the River Welland, a navigable waterway, to the north east of Spalding.

9.5.31 A number of becks, dykes, and land drains are crossed by the proposed Refined Siting Zone, however these watercourses are not navigable waterways and are therefore not considered further within this preliminary Transport and Movement assessment.

## Public Rights of Way and Promoted/Recreational Routes

- 9.5.32 PRowS and promoted/recreational routes potentially affected by the proposed works within the Refined Siting Zone are summarised in Table 9.9 below and presented on **PEI Report Volume 2 Part B Section 5 Figure 9.3 Existing Public Rights of Way (PRow)**. 'P' series references have been applied to each PRow which is crossed by the Refined Siting Zone for ease of reference.
- 9.5.33 The sensitivity of the PRowS and promoted/recreational routes has been considered and is summarised in Table 9.9. The assignment of sensitivity considers potentially highly used routes and routes that have extensive connectivity and/or social significance, such as long distance trails, recreational circular routes or Local Authority promoted routes. For the purposes of the PEIR, the sensitivity assessment is subjective. Further detail, including surveyed usage, will be determined in consultation with the local highway authority and provided within the ES. The sensitivity of routes along the highway are included within the highway link sensitivity at Table 9.8.
- 9.5.34 The Refined Siting Zone crosses The Macmillan Way long distance walking route adjacent to the River Welland.
- 9.5.35 Further details of promoted/recreational routes are included within **PEI Report Volume 2 Part B Section 5 Chapter 11 Socio-economics, Recreation and Tourism** and discussions with PRow officers from all relevant Local Authorities will continue to confirm the key routes for assessment reported within the ES.

Table 9.9 Public Rights of Way and Promoted/Recreational Routes

Ref	Type	Location	Sensitivity
P115/P116/P117	The Macmillan Way long distance walking route	Runs along the River Welland to the north east of Spalding	National route, medium sensitivity
P120/P136	Bridleway	Runs along the southern bank of the River Welland to the north east of Spalding	Leisure route connecting with Spalding, low sensitivity
P098/P132/P133	Footpath	Runs in an approx. east west direction connecting Moulton Seas End with the River Welland	Local route, limited connectivity and use, low sensitivity
P134	Footpath	Short section of footpath connecting local roads to the north of Weston	Local route, limited connectivity and use, low sensitivity

## Future Baseline

- 9.5.36 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.

- 9.5.37 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.
- 9.5.38 Based on the proposed construction programme for the Project, the peak year for construction activities that would affect each road link comprising the Primary Access Routes and Workers Access Routes has been identified as 2031. The future baseline traffic along these road links has been calculated by applying an appropriate growth factor derived from DfT's Trip End Model Presentation Program (TEMPro) to the 2024 Baseline traffic flows. These flows are summarised in **PEI Report Volume 3 Part B Sections 1-7 Appendix 9C Future Baseline and Impact Analysis**.
- 9.5.39 A review of all committed developments will be undertaken for the assessment to be presented within the ES. This will identify any other developments anticipated to be operational prior to construction of the Project commencing, that could generate additional traffic along the identified construction traffic routes.
- 9.5.40 Based upon available information, existing public transport and cycle infrastructure are likely to remain unchanged in the future baseline assessment years.

## 9.6 Design, Control and Mitigation Measures

### Design Mitigation Measures

- 9.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 18) applicable to routing of new overhead line and the 'Horlock Rules' (Ref 19) 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 20) 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.
- 9.6.2 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routeing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works. Specific examples relevant to the Traffic and Movement assessment include:
- i. Construction traffic would be routed along classified roads as far as possible, and haul roads would be used to minimise construction vehicle movements on

- local roads where the impact of the forecast traffic movement is deemed to be unacceptable.
- ii. Primary Access Routes and Worker routes will be further discussed and determined with Local Highway Authority input with a view of utilising the classified road network and SRN as much as practicably possible. Where narrow roads form part of the Primary Access Routes (i.e. closer to bellmouths), areas of temporary highway improvement works (e.g. road widening and creation of passing places) will be considered for implementation to maintain a safe operational highway.
  - iii. Where further assessment identifies the need for off-site road and junction improvements (i.e. mitigation works), these will be designed in collaboration with the local highway authorities to maintain a safe and operational highway network. Any improvements will be set out in the Transport Assessment (TA) and ES.
  - iv. Construction traffic crossing of rail lines or navigable waterways will be avoided or use existing vehicle crossings where possible to minimise the impact on railway and waterway users.
  - v. Where road closures are required, the period of the closure would be kept to a minimum and diversions would be via the most appropriate alternative route. Access to properties would be maintained at all times. Any route diversions or closures will be discussed with the Local Highway Authority.
  - vi. PRow users are unlikely to be significantly affected during the delivery of the Project. PRows will only be closed or diverted on safety grounds to protect PRow users or workers. Haul roads crossing PRows will be designed such that the PRow remains open by default and passing construction traffic affords priority of movement to PRow users. In the locality of PRow crossing points, the haul road will be fenced and gated to prevent PRow users and animals from straying into a construction site.
  - vii. Where more than one PRow crosses the haul road in close proximity to another, local diversions will be required to merge PRows routes across a single passing point to reduce the likelihood of pedestrian-vehicular conflict (including equestrians and horses).
  - viii. PRows will be closed when necessary on safety grounds. This is likely to be over a couple of months during the overhead line stringing works. Where PRow closures are required, the period of the closure would be kept to a minimum, and a diversion provided where necessary and practicable. Any route diversions or closures will be discussed with the local authority.

## Control Mitigation Measures

### Construction

- 9.6.3 Standard mitigation measures, comprising management activities and techniques, would be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance.
- 9.6.4 A draft Preliminary Code of Construction Practice (CoCP) 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 the Traffic and Movement assessment are:

- i. 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.’
- ii. 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: preventing pests and vermin control and treating any infestation promptly, including arrangements for the proper storage and disposal of waste produced on site;
  - 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 site, especially at the beginning and end of the working day; and
  - managing potential off-site contractor and visitor parking.
- iii. GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer’s recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable.
- iv. GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited.
- v. TT01: The contractor(s) will implement a monitoring and reporting system to check compliance with the measures set out within the CTMP.
- vi. 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.

- vii. TT03: The CTMP will set out measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set out measures to reduce safety risks through construction vehicle and driver quality standards and measures to manage AIL's.
- viii. W04: Where watercourses are to be crossed by construction traffic, measures to be applied include the use of temporary culverts or temporary spanned bridges. Once the temporary culvert is installed, the area above the temporary culvert will be backfilled and a suitable surface finish established to permit the passage of plant, equipment, materials, and people. Temporary culverts will be sized to reflect the span width and the estimated flow characteristics of the watercourse under peak flow conditions and kept free from debris. Where used, temporary bridges will be designed specifically to consider the span length and the weight and size of plant and equipment that will cross the bridge.
- ix. AS03: Access to and from residential, commercial, community and agricultural land uses will be maintained throughout the construction period or as agreed through the landowner discussions. This may require signed diversions or temporary restrictions to access. The means of access to affected properties, facilities and land parcels will be communicated to affected parties at the start of the Project, with any changes communicated in advance of the change being implemented. Where field-to-field access points require alteration as a result of construction, alternative field access will be provided in consultation with the landowner/occupier.

9.6.5 The CTMP referred to in measures GG06, TT01 and TT03 above will include, but not be limited to:

- i. measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions;
- ii. measures for the maintenance and upkeep of the public highway;
- iii. identification of access routes for emergency vehicles;
- iv. measures to reduce safety risks through construction vehicle and driver quality standards; and
- v. measures to manage AIL's.

## Additional Mitigation Measures

9.6.6 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.

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

## 9.7 Preliminary Assessment of Effects

- 9.7.1 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 operation activities within Section 5.
- 9.7.2 The preliminary assessment of effects reported below takes into account the Design and Control Measures previously described.
- 9.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in Table 9.11 based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 9.7.4 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

##### Highway Network

- 9.7.5 The primary Traffic and Movement effects on users of the highway network will be as a result of an increase in traffic flows on those roads used by vehicles associated with the Project. An assessment has been undertaken to calculate the percentage increases in total and HGV AADT flows due to construction traffic using the local road network. This is based upon projected changes relative to a future baseline.
- 9.7.6 Traffic and Movement effects associated with the construction phase on receptors relate to the change in traffic flow and the sensitivity of highway links. **PEI Report Volume 3 Part B Sections 1-7 Appendix 9C Future Baseline and Impact Analysis** sets out the predicted increase in traffic on the local road network for each Primary Access Route and Worker Access Routes used by construction traffic. These increases have then been assessed against the assigned sensitivity of each road link.
- 9.7.7 Within this PEI Report the assessment identifies highway links where an increase in baseline traffic flows due to construction traffic exceeds 10 percent for sensitive roads and 30 percent for non-sensitive roads, in accordance with the IEMA Guidance thresholds. On these links there is potential for negative effects on receptors and users of the highway network that may lead to potential significant effects. Therefore, these links have been identified for further consideration within the TA and ES. **PEI Report Volume 3 Part B Section 5 Figure 9.5 Preliminary Impact Analysis** shows the location of highway links that are below or above the IEMA thresholds.
- 9.7.8 At this stage of assessment, baseline data for some of the identified construction traffic access routes is not currently available (from either DfT counts or 2024 traffic surveys). For these routes, a qualitative analysis has been undertaken to consider whether the volume of projected construction traffic is likely to be significant, given the type of road and type of construction vehicles (HGVs or Workers cars/vans).



These links will be considered further within the TA and ES if the total number of all construction vehicles exceeds 50 per day or the number of HGVs exceeds 20 per day.

- 9.7.9 The receptors/users on the highway links exceeding the appropriate sensitivity threshold for potential significant effects are summarised in Table 9.10. At this preliminary stage of the assessment, significant effects upon users of these highway links cannot be ruled out. However, no detailed assessment, in terms of severance, delay (junction assessment), highway safety and fear and intimidation, has yet been undertaken to determine the magnitude of impacts upon these road links. As such, an assessment of the scale of effects upon the receptors identified in Table 9.10 has not yet been completed.
- 9.7.10 Following further assessment of the projected increases in traffic flow upon severance, congestion (potentially resulting in increases in journey time and driver delay), highway safety and fear and intimidation, the subsequent effects upon users of the highway network as a result of the Project will be reported in the ES.

**Table 9.10 Preliminary assessment of effects upon users of highway links – Section 5**

<b>Receptor</b>	<b>Potential Significant Effects</b>	<b>Link Reference</b>
Drivers (all vehicles including HGVs and Emergency Services)	Severance, changes in journey time, driver delay and highway safety effects due to increased traffic	CR9 (A16), LK65 (Marsh Road), LK66 (Stone Gate), LK87 (A151), W40 (Marsh Road), W42 (A151), W50 (A17)
Bus passengers	Potential for delay due to congestion as a result of increased traffic	CR9 (A16), W42 (A151)
Pedestrians and cyclists	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects as a result of increased traffic	CR9 (A16)

### **Operation and Maintenance**

- 9.7.11 Based upon the preliminary assessment, no significant effects upon Transport and Movement receptors within the Section 5 Study Area are predicted during operation and maintenance 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**

- 9.7.12 For completeness, Table 9.11 summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Traffic and Movement effects.

## Construction

### Highway Network

- 9.7.13 Table 9.11 identifies the highway links that form part of the Primary Access Route and Worker Access Route network where construction traffic impacts are below the assessment thresholds and are therefore not likely to have significant effects on users/receptors on these highway links. It is not currently anticipated that these links will be subject to further assessments within the ES, subject to further screening of final construction traffic projections and discussions with the Local Highway Authority. **PEI Report Volume 3 Part B Section 5 Figure 9.5 Preliminary Impact Analysis** shows the location of highway links that are below or above the IEMA thresholds.

### Public Rights of Way and Promoted/Recreational Routes

- 9.7.14 From an accessibility and connectivity perspective, PRoW and promoted/recreational route users are unlikely to be significantly affected during the delivery of the Project. Routes will remain open by default during the construction phase, both during and outside of working hours. Where feasible, there will be a break in the haul road so that the route is not impacted. Where required, haul road crossings are designed such that pedestrian/cycle/equestrian users are afforded priority of movement.
- 9.7.15 Where more than one route crosses the haul road within close proximity of each other, these will be merged to provide a single passing point to reduce the likelihood of conflict with vehicular traffic.
- 9.7.16 PRoWs are anticipated to be closed/diverted for short periods when necessary on safety grounds. This is likely to be during the overhead line stringing works.
- 9.7.17 Design details have not been developed to determine the impacts to PRoW and promoted/recreational routes within the Refined Siting Zone, however based on the proposals identified above, the impacts of the Project are not likely to result in significant effects upon users of the routes listed below and summarised in Table 9.11.
- i. P115/P116/P117 (Macmillan Way) long distance walking route;
  - ii. P120/P136 bridleway;
  - iii. P098/P132/P133 footpath; and
  - iv. P134 footpath.

### Operation and Maintenance

- 9.7.18 The Scoping Report Traffic and Movement chapter sought to scope out effects associated with the operation of the Project. The Scoping Opinion received requested further information relating to operational traffic. This PEI Report assessment therefore presents details of forecast operational traffic movements and provides an initial assessment of potential effects.
- 9.7.19 The operational traffic flows of the Weston Marsh Substation(s) are anticipated to comprise vehicles associated with routine visits and fault maintenance only. It is anticipated that there will two visits per month by two people.
- 9.7.20 With regards to operational visits for the overhead line, based upon existing precedent and National Grid estimates, typical routine maintenance vehicle

movements would comprise up to two vehicle trips per permanent pylon, per year (i.e. one arrival and departure respectively). The movement itself could comprise a light goods vehicle access via the permanent access route. There could also be a drone or helicopter survey taken from the air, taking off from a nearby vantage point. Details of pylons within Section 5 are not known at this stage, however, the total number of vehicles will be negligible and will not impact operation of the highway network.

- 9.7.21 Whilst there may be occasional variation in traffic flows associated with maintenance or refurbishment as required, the projected volume of traffic is predicted to be low.
- 9.7.22 On the basis of the information provided, operational/maintenance traffic will not have material impact on traffic flows and no likely significant effects on users of highway links are expected.
- 9.7.23 Operational traffic flows will be very occasional therefore no impact to users of bus services is expected. No railway lines are crossed as part of Section 5 overhead line, therefore impact to rail users is not expected. No likely significant effects on public transport users are expected.
- 9.7.24 No navigable waterways are impacted by operation of Section 5 of the Project, therefore no likely significant effects are expected.
- 9.7.25 PRow and promoted/recreational routes crossed and/or diverted during construction will be reinstated, therefore no PRow or promoted/recreational routes are permanently affected by Section 5, therefore no significant effects are expected.

Table 9.11 Preliminary Summary of non-significant Traffic and Movement effects – Section 5

Receptor	Impact	Sensitivity	Magnitude of Change	Significance of Effect	Rationale
<b>Construction</b>					
<b>Highway Network</b>					
Road users of highway links CR10, CR11, CR12, CR13, CR14, CR15, CR22, CR23, CR27, CR28, LK79, LK86, LK90, W41, W44, W46, W37, W48, W51, W61, W62, W63, W64	Increased traffic due to construction of the Project, potentially resulting in severance, changes in journey time, driver delay and highway safety effects upon road users	Negligible / Low / Medium	<30%	Low – not significant	The percentage increase in traffic flows as a result of the Project does not meet IEMA thresholds for significant effects.
Road users of highway link LK71, W43, W45, W49, W60,	Increased traffic due to construction of the Project, potentially resulting in severance, changes in journey time, driver delay and highway safety effects due to increased traffic	High	No. of construction HGVs <20 daily	Low – not significant	The volume of projected HGVs movements is low across the day and unlikely to result in significant effects .
Bus passengers in services on highway links LK79 (A151), W41 (A151), W51 (A17)	Increased traffic due to construction of the Project, potentially resulting in delay due to congestion on bus routes.	Negligible / Low / Medium	<30% change in traffic flow	Low – not significant	The percentage increase in traffic flows as a result of the Project does not meet IEMA thresholds and is unlikely to impact bus movements such that there would be a significant

Receptor	Impact	Sensitivity	Magnitude of Change	Significance of Effect	Rationale
					effect upon users of bus services.
Bus passengers in services on highway links W47 (Quadring Road), W64 (A1101)	Increased traffic due to construction of the Project, potentially resulting in delay due to congestion on bus routes.	High	<10% change in traffic flow	Low – not significant	The percentage increase in traffic flows as a result of the Project does not meet IEMA thresholds and is unlikely to impact bus movements such that there would be a significant effect upon users of bus services.
Bus passengers in services on highway link W49 (A151)	Increased traffic due to construction of the Project, potentially resulting in delay due to congestion on bus routes.	High	No. of construction HGVs <20 daily	Low – not significant	The volume of projected HGVs is low across the day and unlikely to impact bus movements.
Pedestrians and Cyclists on links CR10, LK79, W47, W64	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects as a result of increased traffic	Low to High	Varies (<30%, <10% or <20 HGVs daily)	Low – not significant	The volume of construction traffic does not meet IEMA thresholds or considered low (on routes without baseline data) such that it is unlikely to impact pedestrian and cycle movements
All road users	Movement of Abnormal Indivisible Loads during construction potentially resulting in severance, changes in journey time,	Low to High	No change	Negligible – not significant	It is not anticipated that there will be any Abnormal Indivisible Loads required for construction of Section 5 therefore no significant effects are expected.

Receptor	Impact	Sensitivity	Magnitude of Change	Significance of Effect	Rationale
	delay and safety effects upon road users.				
All road users	Movement of Hazardous Loads during construction potentially resulting in safety effects upon road users.	Low to High	No change	Negligible – not significant	It is not anticipated that there will be any Hazardous Loads required for construction of Section 5 therefore no significant effects are expected.
<b>Railway Infrastructure</b>					
Railway users	Potential for disruption of the railway network and/or operational safety	High	Negligible	Negligible – not significant	No railway lines are crossed by the Refined Siting Zone. Therefore, no likely significant effects on railway users are expected.
<b>Waterways</b>					
Waterway Users – including leisure users of the River Welland	Temporary closure of waterways to facilitate overhead line stringing works, resulting in potential delay, amenity effects upon users.	Low	Negligible	Negligible – not significant	The Section 5 overhead line will likely cross over the River Welland, however, any construction haul road will not traverse the navigable waterway. Temporary overnight closures will be implemented to facilitate stringing of overhead line. National Grid will seek agreement with the relevant stakeholders prior to temporary closures. The planned works are unlikely

Receptor	Impact	Sensitivity	Magnitude of Change	Significance of Effect	Rationale
					to result in significant effects upon waterway users as the work will be undertaken outside of peak operational times to minimise impact..
<b>Public Rights of Way and Promoted/Recreational Routes</b>					
Pedestrians, cyclists and equestrians on links P115/P116/P117 (Macmillan Way), P120/P136, P098/P132/P133 and P134	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects as a result of temporary route closures/diversions to enable construction	Low / Medium	No change	Negligible – not significant	Details are not confirmed, however, the measures identified will manage interactions with construction traffic and limit potential diversions such that the works are unlikely to result in significant effects to pedestrian, cyclists and equestrians
<b>Operation</b>					
Road users, public transport users, pedestrians, cyclists and equestrians of all routes	Operational traffic resulting in potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects.	Negligible – Medium	2 visits per month to substation(s) and 1 visit per year for each pylon for maintenance	Negligible – not significant	The volume of traffic associated with operation and maintenance is very low and will not result in significant effects upon users of highway links
Railway users	Potential to delay due closure of rail lines	High	No impact	Negligible – not significant	Rail lines will not be closed during operation

<b>Receptor</b>	<b>Impact</b>	<b>Sensitivity</b>	<b>Magnitude of Change</b>	<b>Significance of Effect</b>	<b>Rationale</b>
Waterway users	Potential to delay due to closure of waterways	Low	No impact	Negligible – not significant	Waterways will not be closed during operation
Pedestrians, cyclists and equestrians on PRow	Potential for severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects	Low / Medium	No impact	Negligible – not significant	PRow will be reinstated and not impacted by operation of the Substation(s) and overhead line



## **9.8 Monitoring**

- 9.8.1 As set out within the Preliminary CoCP, the Contractor will implement a CTMP, which will detail the environmental and control measures in relation to the traffic generated during construction of the Project.
- 9.8.2 This will include undertaking of dilapidation surveys prior to the start of the relevant phase of construction and identification of any remedial works required to access routes.
- 9.8.3 The contractor will also implement a monitoring and reporting system to check compliance with the measures set out within the CTMP, as per measure TT01 of the Preliminary CoCP.
- 9.8.4 Otherwise, no monitoring relevant to the Traffic and Movement assessment and reported impacts and effects is proposed during operation and maintenance of the Project within the Section 5 Study Area.

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# 10. Noise and Vibration

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# 10. Noise and Vibration

## 10.1 Introduction

- 10.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the assessment of Noise and Vibration on noise sensitive receptors (NSR) for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 10.1.2 The assessment for Section 5 is based on a Refined Siting Zone boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 10.1.3 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 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 subsequent scope of the Noise and Vibration assessment (section 10.3). 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 Noise and Vibration assessment within Section 5 (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**;
  - v. A description of the environmental baseline within the Section 5 Study Area relevant to the assessment (section 10.5);
  - vi. A description of mitigation measures included for the purposes of the Noise and Vibration assessment reported within the PEI Report (section 10.6). 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 Noise and Vibration effects arising during construction and operation of the Project within the Section 5 Study Area, based upon the assessment completed to date (section 10.7); and
  - viii. An outline of the likely monitoring requirements in relation to Noise and Vibration (section 10.8).

10.1.4 Further supporting information is set out in **Table 10.1** below, including supporting figures and technical appendices.

Table 10.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 10.1 Noise and Vibration Study Area</b> <b>Figure 10.2 Noise and Vibration Baseline</b>
<b>PEI Report Volume 3 Part B Section 5 Appendix 10A Construction Noise and Vibration Data</b>	Includes information and data used within the assessment of noise and vibration effects from construction activities at noise and vibration sensitive receptors.
<b>PEI Report Volume 3 Part B Section 5 Appendix 10B Construction Traffic Noise Assessment</b>	Includes the assessment of construction traffic noise on construction traffic routes within Section 5.
<b>Project Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.

Supporting Information	Description
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 10.1.5 There are interrelationships between the potential Noise and Vibration effects 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 5 Chapter 4 Ecology and Biodiversity** assesses the effects of the Project upon ecological receptors, including those resulting from noise and vibration.
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 5 Historic Environment** assesses the impacts of the Project upon heritage assets, including the potential effects of vibration.
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Transport** assesses the potential change in traffic movements during construction and operation, which are relevant to the assessment of noise effects associated with changes in traffic flow.
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 11 Socio-economics, recreation and tourism** assesses potential effects upon recreational areas that could be affected by noise and vibration and thus suffer a reduction in amenity value.
  - v. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.
  - vi. **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing** assesses the potential effects of noise and vibration generated by the Project upon health and wellbeing.
  - vii. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.



## 10.2 Legislation and Policy Framework

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, the details of which are set out in **Table 10.1**.

### Regional and Local Policy

10.2.2 Regional and local plans or policies relevant to this assessment are as follows.

- i. South East Lincolnshire (Combined Boston Borough Council, South Holland District Council Local Plan) 2013:
  - Policy 2: Development Management: which sets out sustainable development considerations against which planning applications are determined by the local planning authority, including impacts upon neighbouring land uses by reason of noise.
  - Policy 30: Pollution: which stipulates that development will not be permitted where it would lead to unacceptable adverse impacts due to noise, including vibration.
  - Policy 31: Climate Change and Renewable and Low Carbon Energy: in relation to the development of renewable energy facilities and associated infrastructure, development will be permitted provided that there would be no significant harm to residential amenity in respect to noise, vibration and other factors.

## 10.3 Scope of Assessment

10.3.1 The scope of the assessment 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 EIA Scoping Report (Ref 3). A summary of the Scoping Opinion together with a response against each point of relevance to the Landscape chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.

10.3.2 Non-statutory consultation feedback has been addressed within the **Grimsby to Walpole Stage 1 Consultation Feedback Report**.

10.3.3 The scope of the Noise and Vibration assessment within Section 5 includes consideration of effects upon NSRs due to:

- i. construction noise;
- ii. construction vibration on people within buildings;
- iii. construction vibration on buildings and structures;
- iv. construction traffic noise; and
- v. noise and vibration from substantial maintenance activities, such as conductor replacement.

10.3.4 It is currently assumed that noise generating equipment (such as transformers) will not be required within the Weston Marsh Substation(s). Additionally, based upon the

low noise conductor system proposed, noise associated with the operation of permanent infrastructure is scoped out of the assessment of Noise and Vibration effects within this Section at this stage. This will be reviewed as the substation(s) design is developed further.

- 10.3.5 As set out in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**, assessment of operational noise effects due to overhead line and typical maintenance activities are also scoped out, based upon the low noise conductor system proposed, and the infrequent and localised nature of typical maintenance activities, respectively.

## 10.4 Assessment Methodology

- 10.4.1 The assessment methodology, relevant guidance, key assumptions and limitations for the Noise and Vibration 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 described and assigned to the assessment. A summary of the key components are outlined below.
- 10.4.2 Construction Noise and Vibration has been assessed based on the principals described in British Standard (BS) 5228-1:2009+A1:2014 Code of practice for Noise and Vibration control on construction and open sites – Part 1: Noise (BS 5228-1) (Ref 4), and Part 2: Vibration (BS 5228-2) (Ref 5), respectively. The assessment of construction noise and vibration within Section 5 is however qualitative at this stage and based upon professional judgement, given that the location of the Weston Marsh Substation(s) and connecting infrastructure has not yet been decided. Following further consultation and design development, the noise and vibration assessment of Section 5 will be completed in accordance with Part 1 and Part 2 of BS 5228-1 and reported within the ES.
- 10.4.3 Construction traffic noise has been predicted in accordance with the methodology described in Calculation of Road Traffic Noise (CRTN) (Ref 6) and assessed in accordance with the methodology described in the Design Manual for Roads and Bridges LA 111 Noise and vibration (DMRB LA 111) (Ref 7).
- 10.4.4 Other applicable guidance has also been used to inform the assessments, where appropriate. These are detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.

### Assessment Assumptions and Limitations

- 10.4.5 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 10.4.6 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**. In addition to these, the following Section 5 specific Noise and Vibration assessment assumptions and limitations have been applied:
- i. The construction noise and vibration assessment is based on assumed proposed construction activities and associated indicative plant Noise and Vibration data. Further detailed assessments will be conducted by the contractor prior to

commencing works, based on their specific construction methodologies, to inform their specific mitigation proposals, as per Preliminary CoCP measure NV03;

- ii. The location of proposed infrastructure, and therefore the location of the associated construction activities is not currently known within Section 5. The assessment of construction noise and vibration is therefore limited to identifying distances within which effects may occur, calculated in accordance with the methodology described in BS 5228-1 and BS 5228-2, and providing outline mitigation measures; and
- iii. The assessment of construction traffic noise is based on information provided within the Traffic and Transport assessment presented in **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Transport**.

10.4.7 The key parameters and assumptions which inform the assessment 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.

## 10.5 Baseline Conditions

### Study Area

10.5.1 The Study Area for the assessment of the Noise and Vibration baseline is illustrated in **PEI Report Volume 2 Part B Section 5 Figure 10.1 Noise and Vibration Study Area**. The baseline Study Area includes an additional 1 km buffer from the draft Section 5 siting area.

### Data Collection

10.5.2 The following data has been used to inform the baseline conditions:

- i. Ordnance Survey (OS) AddressBase Plus data, as presented within PEI Report Volume 2 Part B Section 5 Figure 10.1 Noise and Vibration Study Area;
- ii. Department for Environment, Food and Rural Affairs (Defra) strategic noise mapping, presented as noise contours within **PEI Report Volume 2 Part B Section 5 Figure 10.2 Noise and Vibration Baseline**. This represents the daytime ambient noise levels from road and rail sources and Noise Important Areas (NIAs); and
- iii. current OS mapping.

### Existing Baseline

10.5.3 The following section outlines the Noise and Vibration baseline for Section 5. The baseline section should be read in conjunction with the following supporting Figures and Appendices as found within **PEI Report Volume 2** and **Volume 3** respectively:

- i. **PEI Report Volume 2 Part B Section 5 Figure 10.1 Noise and Vibration Study Area**; and

ii. **PEI Report Volume 2 Part B Section 5 Figure 10.2 Noise and Vibration Baseline.**

- 10.5.4 Section 5 is located within a predominantly rural area, and whilst the specific location of the substation(s) and connecting transmission infrastructure are yet to be determined, these will largely avoid settlements and residential areas. The majority of assessed NSRs within the Study Area are isolated dwellings and farms and small settlements, however, the Section 5 boundary is located in proximity to several villages and built-up areas. These include:
- i. Surfleet Seas End, approximately 200m west of the Refined Siting Zone;
  - ii. Spalding, approximately 700m west of the Refined Siting Zone; and
  - iii. Weston, approximately 300m southeast of the Refined Siting Zone.
- 10.5.5 **PEI Report Volume 2 Part B Section 5 Figure 10.1 Noise and Vibration Study Area** also shows NSR locations, including residential and non-residential receptors.
- 10.5.6 The noise environment is expected to vary around the Study Area depending on the nature of the area. For example, close to noise sources, such as roads and in built up areas, ambient noise levels are expected to be higher. Further away from roads and in rural areas which cover most of Section 5, ambient and background noise levels would be expected to be lower. Daytime noise level contours from existing road and railway sources are presented in **PEI Report Volume 2 Part B Section 5 Figure 10.2 Noise and Vibration Baseline**, showing how existing noise levels vary along the Study Area. Areas outside of the contours are generally considered to have low ambient and background noise levels. Areas where the road and rail contours overlap are considered to experience noise effects from both sources.
- 10.5.7 NIAs are determined via strategic noise maps and highlight the residential areas experiencing the highest 1 per cent of noise levels from road and rail sources in England and are shown in **PEI Report Volume 2 Part B Section 5 Figure 10.2 Noise and Vibration Baseline**. There are no NIAs close to the draft Order Limits.
- 10.5.8 Acceptable levels of vibration during construction are higher than those that would be acceptable during normal conditions, because it is accepted that temporary vibration impacts may be an unavoidable by-product of development. It is assumed that existing vibration levels at NSRs within the Study Area are negligible compared to the construction vibration threshold values, as described in **PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information**. Construction vibration impacts are therefore assessed against fixed thresholds, rather than relative thresholds informed by an assessment of the baseline.
- 10.5.9 The main sources of environmental noise within the Section 5 Study Area include the A16 approximately 0.5 to 1.5 km west of the Section 5 siting area, and the A151 immediately to the south of the Section 5 siting area, as well as traffic on local roads. In terms of industrial sources, the main source of noise is likely to be agricultural activity.

## Future Baseline

- 10.5.10 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.

- 10.5.11 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.
- 10.5.12 At this preliminary stage, no significant changes to the future Noise and Vibration baseline that would affect the assessment are anticipated. This is owing to the largely rural and agricultural nature of the Refined Siting Zone.

## 10.6 Design, Control and Additional Mitigation Measures

### Design Mitigation Measures

- 10.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 8) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 9), which apply to the design and siting of substations. These approaches are explained in further detail within the Corridor Preliminary Routeing and Siting Study (CPRSS) (Ref 9) 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.
- 10.6.2 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routeing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.
- 10.6.3 The proposed overhead line system is a 'Triple Araucaria' conductor bundle on standard lattice pylons. Noise from high voltage overhead lines is primarily due to a phenomenon called corona discharge. Overhead line noise is generated when the conductor surface voltage gradient (electric stress, or  $E_{max}$  expressed in kilovolts per centimetre (kV/cm)) exceeds the inception level for corona discharge activity which is released as acoustic energy and radiates into the air as sound. In UK conditions the corona inception level is regarded to occur when electric stress is in the range 17 to 20kV/cm. Whilst most high voltage overhead lines are designed to operate below this level, those that operate close to this may produce audible noise when enhancement of conductor surface electric stress occurs due to rainfall (wet noise) or the presence of conductor surface contamination (dry noise). Overhead lines that operate significantly below the corona inception level are much less likely to produce audible noise. 'Triple Araucaria' is regarded as practically quiet during both dry and wet weather conditions as it typically operates with an electrical stress below the inception level for corona discharge. Operational noise from the proposed

overhead line would therefore not lead to significant adverse effects at nearby NSR, even if directly underneath the line. This supports the rationale for scoping operational noise out of the assessment.

- 10.6.4 In addition, pylon fittings, such as insulators, dampers, spacers, and clamps, are designed and procured in accordance with a series of National Grid Technical Specifications and must be type registered (rigorously tested) to ensure the fitting conforms to National Grid standards. These design, testing, and procurement processes reduce the potential for audible noise and tones to occur from all types of fittings, including insulators. Where noise does occur, it is likely to be localised and of short duration. If this is due to a fault, action can be taken to rectify it. Where noise from fittings does occur which results in a complaint, appropriate action can be taken to seek to remedy the cause of the noise where practicable, usually through cleaning or replacing the relevant fitting.

## Control Mitigation Measures

### Construction

- 10.6.5 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 Noise and Vibration assessment of Section 5 include:
- i. GG01: The Project will be compliant with all relevant legislation, consents and permits.
  - ii. 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.
  - iii. 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.
- 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 Plan (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.’
  - 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.
  - vi. GG10: The name and contact details for the Project will be displayed at the entrance to all compounds. This will include an emergency number.
  - vii. 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.
  - viii. GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer’s recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable.
  - ix. GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited.
  - x. GG24: Working areas will be appropriately fenced. The type of fencing installed will depend on the area to be fenced and will take into consideration the level of security required in relation to the surrounding land and public access, rural or urban environment and arable or stock farming. For some locations the fence used may also serve to provide acoustic and visual screening of the work sites and reduce the potential for disturbance of users in the surrounding areas. Fencing will be regularly inspected and maintained and removed as part of the demobilisation unless otherwise specified.
  - xi. 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.

- xii. TT03: The CTMP will set out measures to reduce route and journey mileage to and from and around site, and prevent nuisance to the residents, businesses and the wider community caused by parking, vehicle movements and access restrictions. It will also provide suitable control for the means of access and egress to the public highway and set out measures for the maintenance and upkeep of the public highway. The plan will also identify access for emergency vehicles. It will also set out measures to reduce safety risks through construction vehicle and driver quality standards and measures to manage abnormal loads.
- xiii. 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 (BPM) to reduce construction noise will be set out within the CEMP.
- xiv. NV02: BPM 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.
- xv. NV03: The contractor will conduct detailed construction Noise and Vibration assessments to determine whether there are likely to be any new or different significant adverse effects at Noise and Vibration sensitive receptors (NSR) and therefore whether additional measures, including site-specific BPM, may be required.

### **Control of Pollution Act 1974**

- 10.6.6 The Control of Pollution Act 1974 (CoPA) (Ref 11) sets out the framework for the legislative control of construction Noise and Vibration on any given site. It also sets out the principle of best practicable means (BPM) (as defined in Section 72 of the Act) and how that should be applied to construction activity noise. BS 5228-1 and BS 5228-2 gained Approved Code of Practice status in England under the powers conferred by sections 71(1)(b), (2) and (3) of CoPA 1974, as enacted under The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 (Ref 12). Compliance with the best practice noise and vibration mitigation requirements stated within BS 5228-1 and BS 5228-2 became a statutory obligation under the Act.
- 10.6.7 Section 61 of the CoPA states that consent may be sought from the relevant local authorities prior to the construction works commencing. If prior consent is sought, the relevant local authorities will need to be provided with information about the proposed construction works and how construction noise will be managed, including the use of BPM.

### **Additional Mitigation Measures**

- 10.6.8 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.



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

## 10.7 Preliminary Assessment of Effects

10.7.1 The following section presents the findings of the preliminary assessment of effects upon the receptors, identified within the Section 5 Study Area, as a result of construction, maintenance and/or operational activities.

10.7.2 The preliminary assessment of effects reported below takes into account the Design and Control Measures previously described.

10.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this section in **Table 10.2**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**

10.7.4 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

10.7.5 Based upon the preliminary assessment, no significant effects have been identified due to construction noise and vibration, assuming the implementation of the embedded measures set out in section 10.6. The assessment is discussed in further detail below.

#### Operation

10.7.6 No significant effects have been identified due to noise and vibration during operation and maintenance of the Project in Section 5.

### Non-Significant Effects

#### Construction

##### Construction Noise

10.7.7 The construction noise assessment is based on the construction noise data presented in **PEI Report Volume 3 Part B Section 5 Appendix 10A Construction Noise and Vibration Data** for the various proposed construction activities, which in Section 5 include:

- i. Vegetation clearance and site preparation;
- ii. Establishment of temporary access/egress to the Site and haul routes;

- iii. Establishment and operation of construction compounds and laydown areas;
  - iv. Construction of pylon foundations and erection of pylons;
  - v. Stringing of OHL;
  - vi. Construction of substation(s);
  - vii. Ancillary works, such as drainage; and
  - viii. Removal of compounds and haul roads and site reinstatement.
- 10.7.8 Without mitigation, there are potential significant adverse effects from construction noise where construction activities occur within approximately 50m to 100m of NSRs, depending on the activity, the sensitivity of the NSR, and the duration of the activity.
- 10.7.9 With noise mitigation, such as screening and other BPM, significant adverse effects would only be expected to occur within approximately 20 to 40m of construction activities, again, depending on the activity, the sensitivity of the NSR, and the duration of the activity.
- 10.7.10 Given the rural nature of the Refined Siting Zone and the relative sparsity of NSRs, it is expected that the Project would be designed such that distances between construction activities and NSR would be relatively large. Where this is the case, construction noise levels would be expected to be below the threshold for potential significant adverse effects. In the unlikely event that it may not be feasible to reduce construction noise levels below the threshold for potential significant effects (i.e. if construction works are located very close to a NSR), temporal restrictions may be put in place, as part of BPM, such that significant adverse effects do not occur. Significant adverse effects from construction noise would therefore not be expected.

### Construction Vibration

- 10.7.11 The construction vibration assessment is based on the construction vibration data presented in in **PEI Report Volume 3 Part B Section 5 Appendix 10A Construction Noise and Vibration Data** for the various proposed construction activities, which include
- i. Construction of access tracks;
  - ii. Construction and operation of construction compounds;
  - iii. Construction of the proposed Weston Marsh substation(s); and
  - iv. Construction of pylons.

### Construction Vibration on People in Buildings

- 10.7.12 Without mitigation, there are potential significant adverse effects from construction vibration on people within buildings where vibratory construction activities occur within approximately 18m to 70m of NSRs, depending on the activity, the sensitivity of the NSR, and the duration of the activity.
- 10.7.13 With noise mitigation, such as use of an alternative method or other BPM, significant adverse effects can in principle be entirely avoided at any distance.
- 10.7.14 As per construction noise, given the rural nature of the Refined Siting Zone and the relative sparsity of NSRs, it is expected that the Project would be designed such that distances between construction activities and NSR would be relatively large. Where

this is the case, construction vibration levels would be expected to be below the threshold for potential significant adverse effects. In the unlikely event that it may not be feasible to reduce construction noise levels below the threshold for potential significant effects (i.e. if construction works are located very close to a NSR and alternative methods are not feasible), temporal restrictions may be put in place, as part of BPM, such that significant adverse effects do not occur. Significant adverse effects from construction vibration would therefore not be expected.

#### Construction Vibration on Buildings and Structures

- 10.7.15 Without mitigation, there are potential significant adverse effects from construction vibration on buildings and structure where vibratory construction activities occur within approximately 10m of the building or structure, depending on the activity.
- 10.7.16 With noise mitigation, such as use of an alternative method or other BPM, significant adverse effects can in principle be entirely avoided at any distance. Therefore, with suitable mitigation measures in place in the form of BPM, there are no likely significant effects from construction vibration on buildings and structures. This will be reviewed further at ES stage and by the contractor prior to starting works as per Preliminary CoCP measure NV03.

#### Construction Traffic Noise

- 10.7.17 The initial construction noise assessment outputs are presented in **PEI Report Volume 3 Part B Section 5 Appendix 10B Construction Traffic Noise Assessment**.
- 10.7.18 Construction traffic noise impacts have been assessed on five construction traffic road links in Section 5 where data is available. The assessment indicates that construction traffic would lead to the following impacts:
- i. no change in noise level on three road links; and
  - ii. a negligible increase in noise level on two road links.
- 10.7.19 No medium or large magnitude construction traffic noise impacts are expected within the Section 5 Study Area. Additionally, there are no small magnitude impacts in locations which include NIAs (where a small magnitude impact may be considered significant). Therefore, there are no likely significant effects from construction traffic noise within the Section 5 Study Area, noting the limitations of the assessment at this preliminary stage.

### Operation and Maintenance

#### Operational Maintenance Noise and Vibration

- 10.7.20 As noted in section 10.3, noise impacts from standard operational maintenance activities are scoped out of the assessment. However, there may be instances where more substantial activity would be required as part of maintenance, such as replacement of components of the Project, such as overhead line re-stringing. Such activities would be expected to be similar to those during the construction phase, as assessed above. As such, there are no likely significant adverse effects from noise and vibration generated during operational maintenance in Section 5, even without specific BPM mitigation measures.

10.7.21 For completeness, **Table 10.2** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Noise and Vibration effects.

Table 10.2 Preliminary summary of non-significant Noise and Vibration effects – Section 5

<b>Receptor</b>	<b>Impact</b>	<b>Sensitivity/ Importance/ Value of Receptor</b>	<b>Magnitude of Change</b>	<b>Significance</b>	<b>Rationale</b>
<b>Construction</b>					
All residential noise sensitive receptors (NSR) within the study area	Construction noise	Residential	Negligible to small	Negligible to minor adverse. Not significant	Significant adverse effects would not be expected where BPM are applied to reduce potential impacts.
Non-residential NSR within the study area	Construction noise	Low to Medium	Negligible to small	Negligible to minor adverse. Not significant	Significant adverse effects would not be expected where BPM are applied to reduce potential impacts.
All NSR within study area	Construction vibration	Residential, and high sensitivity non-residential	Negligible to small	Negligible to minor adverse. Not significant	Significant adverse effects would not be expected where BPM are applied to reduce potential impacts.
Buildings and structures within study area	Construction vibration	Buildings and structures	Below threshold for potential damage	Not significant	Significant adverse effects would not be expected where BPM are applied to reduce potential impacts.
All NSR within study area	Construction traffic noise	Medium	Negligible to small	Negligible to minor adverse. Not significant	No medium or large magnitude construction traffic noise impacts are expected in Section 5. Additionally, there are no small magnitude impacts in locations which include NIAs (where a small magnitude impact may be considered significant). Therefore, there are no likely significant

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
					effects from construction traffic noise in Section 5.
<b>Operation</b>					
All NSR within study area	Operational noise and vibration from substantial maintenance activities during operation.	Residential, and non-residential NSR	Negligible to small	Negligible to minor adverse. Not significant	Operational noise and vibration from substantial maintenance activities is expected to be similar to that during construction, and would incorporate best practicable means to reduce the effects of noise and vibration. The effects of substantial maintenance during operation are therefore expected to be not significant.

## 10.8 Monitoring

- 10.8.1 The following processes and monitoring will be undertaken in the management of Noise and Vibration in accordance with the Preliminary CoCP:
- i. Further detailed construction Noise and Vibration assessments will be conducted by the contractor based on their specific proposed construction methodologies prior to construction.
  - ii. Based on the findings of the contractor's detailed construction Noise and Vibration assessments, specific BPM mitigation measures will be determined to avoid significant adverse effects and reduce and minimise adverse effects.
- 10.8.2 It is anticipated that the Preliminary CoCP will be secured through DCO requirements.
- 10.8.3 If appropriate, through consultation with the local authority, the contractor may apply for prior approval under Section 61 of the CoPA (Ref 11) for certain construction activities.

# References

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- 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 18 October 2024].
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- Ref 4 BS 5228-1:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 1: Noise, British Standard Institution, 2014.
- Ref 5 BS 5228-2:2009+A1:2014 Code of practice for noise and vibration control on construction and open sites – Part 2: Vibration, British Standard Institution, 2014
- Ref 6 Department for Transport (1988). Calculation of Road Traffic Noise.
- Ref 7 Highways England et al. (2020). Design Manual for Roads and Bridges LA 111 Noise and vibration.
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- Ref 9 National Grid. NGC Substations and the Environment: Guidelines on Siting and Design. [online] Available at: <https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf> [Accessed 20 September 2024].
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- Ref 11 Control of Pollution Act 1974 [online]. Available at: <https://www.legislation.gov.uk/ukpga/1974/40/contents> [Accessed 18 September 2024].
- Ref 12 The Control of Noise (Code of Practice for Construction and Open Sites) (England) Order 2015 [online]. Available at: <https://www.legislation.gov.uk/uksi/2015/227> [Accessed 21 January 2025].



# 11. Socio- economics, Recreation and Tourism

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# 11. Socio-economics, recreation and tourism

## 11.1 Introduction

- 11.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Socio-economic, recreation and tourism assessment for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 11.1.2 The assessment for Section 5 is based on a Refined Siting Zone boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 11.1.3 Specifically, the chapter includes the following sections:
- i. An introduction to the topic (Section 11.1);
  - ii. Identification of key local and regional policy relevant to the assessment (Section 11.2). 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 11.3). 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 within Section 5 (Section 11.4). 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 Section 5 Study Area relevant to the Socio-economics, recreation and tourism assessment (Section 11.5);
  - vi. A description of mitigation measures included for the purposes of the Socio-economics, recreation and tourism assessment reported within the PEI Report (Section 11.6). 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 and operation of the Project within Section 5, based upon the assessment completed to date (Section 11.7); and
- viii. An outline of the proposed monitoring requirements in relation to Socio-economics, recreation and tourism (Section 11.8).

11.1.4 Further supporting information is set out in **Table 11.1** below, including supporting figures and technical appendices.

Table 11.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
PEI Report Volume 2 Part B Section 5 Figures	<p><b>Figure 11.1 – Local Business Receptors and Community Facilities Within the Study Area</b></p> <p><b>Figure 11.2 – Development Land Allocations and Open Space Within the Study Area</b></p> <p><b>Figure 11.3 – PRow and Promoted/Recreational Routes Within the Study Area</b></p>
<b>Project Supporting Documentation</b>	
PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
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 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.

Supporting Information	Description
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 11.1.5 There are also interrelationships related to the 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**:
- i. **PEI Report Volume 2 Part B Section 5 Chapter 3 Visual**, should be consulted in relation to amenity effects on users of Public Rights of Way (PRoWs) and promoted/recreational routes.
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 8 Agriculture and Soils**, in regard to effects on agricultural landholdings.
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement**, should be consulted in relation to impacts on access, users of PRoWs and promoted/recreational routes.
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 10 Noise and Vibration**, should be consulted in relation to effects on noise and vibration sensitive receptors. This includes residential and community receptors, local businesses, and users of PRoWs and promoted/recreational routes.
  - v. **PEI Report Volume 2 Part B Section 5 Chapter 12 Air Quality**, should be consulted in relation to effects on residential and community receptors, and local businesses.
  - vi. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment.

- vii. **PEI Report Volume 2 Part C Route-wide Assessment Chapter 7 Socio-economics, recreation and tourism**, should be consulted in relation to the assessment of impact on affected communities, the labour market and effects on tourism bedspaces, and strategic visitor attractions.
- viii. **PEI Report Volume 2 Part C Route-wide Assessment Chapter 8 Health and Wellbeing**, should be consulted in relation to the indirect amenity effects on population and users of PRowS and promoted/recreational routes.
- ix. **PEIR Report Volume 2 Part C Route-wide Assessment Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.

## 11.2 Legislation and Policy Framework

- 11.2.1 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 11.1**.

### Regional and Local Policy

- 11.2.2 Regional and local plans or policies relevant to this assessment are as follows.
  - i. South East Lincolnshire Local Plan (Ref 1):
    - Policy 7 Improving South East Lincolnshire’s Employment Land Portfolio – 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 –identifies employment locations within the plan area and outlines key development principles, to ensure delivery of a mix of employment opportunities that include the target sector of the tourism economy; and
    - Policy 9 Promoting a Strong Visitor Economy - sets out that the Council will support tourism in South East Lincolnshire and promote developments that enhance the local economy, communities and visitors.
  - ii. Lincolnshire Minerals and Waste Local Plan (Ref 2):
    - 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; and
    - 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.

## 11.3 Scope of Assessment

- 11.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 4) provided by the Planning Inspectorate in September 2024 on behalf of the Secretary of State, following the submission of the EIA Scoping Report (Ref 5). 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-economic, 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**.
- 11.3.2 Non statutory consultation feedback is summarised within the **Grimsby to Walpole Non-Statutory Consultation Feedback Report**.
- 11.3.3 The scope of the construction assessment covers the following receptor groups:
- i. Local businesses;
  - ii. Development land;
  - iii. Community facilities;
  - iv. Open space;
  - v. Users of PRoWs and promoted/recreational routes; and
  - vi. Aviation.
- 11.3.4 Where effects may be felt regionally, such as those relating to the labour market (including employment, supply chain effects, training and apprenticeship opportunities, as well as any impact on tourism bedspace from the construction workforce), affected communities (local communities including populations of towns and villages) and strategic visitor attractions that are of importance to the economy during construction, this is considered in **PEI Report Volume 2 Part C Route-Wide Chapter 7 Socio-economics, recreation and tourism**.
- 11.3.5 As outlined in the Scoping Report (Ref 5), the effects of the Project's operation and maintenance phases on the receptor groups outlined above are not likely to give rise to significant effects and are therefore scoped out of the assessment. However, acknowledging the Scoping Opinion (Ref 4), where significant effects have the potential to be felt, this is reported on as appropriate.

## 11.4 Assessment Methodology

- 11.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Socio-economics, recreation and tourism 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 described and assigned to the assessment. A summary of the key components are outlined below.
- 11.4.2 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.

## Assessment Assumptions and Limitations

- 11.4.3 The Section 5 design assumptions and limitations, which have been incorporated into the assessment, are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 11.4.4 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**. In addition to these, the following Section 5 specific Socio-economics, recreation and tourism assessment assumptions and limitations have been applied:
- i. there would be no direct land take from any socio-economic receptors in relation to Section 5, subject to refined design for this Section; and
  - ii. the scale of the construction workforce in relation to Section 5 cannot be assessed until a refined design is known.
- 11.4.5 The key parameters and assumptions which inform the assessment 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 applicable to the full assessment, particularly drawing attention to any areas that may have changed from that presented in this preliminary assessment.

## 11.5 Baseline Conditions

### Study Area

- 11.5.1 The Study Area for the assessment of Socio-economic, recreation and tourism effects varies dependent on the likely spatial extent of the effect under consideration, as per the Scoping Opinion (Ref 4).
- 11.5.2 The proposed Study Areas for Section 5 is shown on:
- i. **PEI Report Volume 2 Part B Section 5 Figure 11.1 – Local Business Receptors and Community Facilities Within the Study Area;**
  - ii. **PEI Report Volume 2 Part B Section 5 Figure 11.2 – Development Land Allocations and Open Space Within the Study Area;** and
  - iii. **PEI Report Volume 2 Part B Section 5 Figure 11.3 – PRow and Promoted/Recreational Routes Within the Study Area.**
- 11.5.3 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.
- 11.5.4 **Table 11.2** below summarises the Study Areas considered for each receptor type that are considered within this Chapter.



Table 11.2 Study Areas

Receptor Type	Study Area
Local businesses – Indirect effects	Within 500 m of the Refined Siting Zone boundary
Development land – Direct effects	Within the Refined Siting Zone boundary
Development land – Indirect effects	Within 500 m of the Refined Siting Zone boundary
Community facilities – Indirect effects	Within 500 m of the Refined Siting Zone boundary
Open space – Direct effects	Within the Refined Siting Zone boundary
Open space – Indirect effects	Within 500 m of the Refined Siting Zone boundary
Users of PRow of local significance – Direct effects	Within the Refined Siting Zone boundary
Users of PRow of local significance – Indirect effects	Within 500 m of the Refined Siting Zone boundary
Users of promoted/recreational routes – Direct effects	Within the Refined Siting Zone boundary
Users of promoted/recreational routes – Indirect effects	Within 500 m of the Refined Siting Zone boundary
Aviation – Indirect effects	Within 5 km from the centre of the Refined Siting Zone

- 11.5.5 The Study Area for aviation receptors is 5 km from the centre of the Refined Siting Zone.
- 11.5.6 For the purposes of this assessment, direct effects can be defined as that 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.
- 11.5.7 The local labour market, effects on the construction workforce and tourism bed spaces, affected communities and strategic visitor attractions will be considered as part of the **PEI Report Volume 2 Part C Route-wide Chapter 7 Socio-economics, recreation and tourism**, owing to the nature of the impacts which will be felt at a regional level.

## Data Collection

- 11.5.8 The following data has been used to inform the baseline conditions:
- i. South East Lincolnshire Council Local Plan (Ref 1);
  - ii. Lincolnshire County Council Minerals and Waste Local Plan (Ref 2);

- iii. Central Lincolnshire Local Plan (Ref 3);
- iv. Ordnance Survey (OS) Open Greenspace (Ref 6);
- v. OS Local Important Buildings (Ref 7);
- vi. OS AddressBase (Ref 8);
- vii. Traffic count data from surveys undertaken by Traffic and Movement, which include pedestrians, cyclists and equestrians;
- viii. Designated non-motorised user (NMU) routes and PRowS from Sustrans (Ref 9 and Ref 10);
- ix. Lincolnshire County Council definitive maps (Ref 11); and
- x. Weston Parish definitive maps (Ref 12).

## Existing Baseline

- 11.5.9 The following section outlines the Socio-economics, recreation and tourism baseline. The baseline section should be read in conjunction with the following supporting Figures as found within **PEI Report Volume 2**:
- i. **PEI Report Volume 2 Part B Section 5 Figure 11.1 – Local Business Receptors and Community Facilities Within the Study Area;**
  - ii. **PEI Report Volume 2 Part B Section 5 Figure 11.2 – Development Land Allocations and Open Space Within the Study Area;** and
  - iii. **PEI Report Volume 2 Part B Section 5 Figure 11.3 – PRow and Promoted/Recreational Routes Within the Study Area.**

### Local Businesses

- 11.5.10 The local businesses in this area possess some economic value, with potential for substitution, and as such are assigned a Medium sensitivity, However, some assets are considered to have a Low sensitivity as they are not likely to incur any loss or gain from changes in the environment.
- 11.5.11 It is acknowledged that Wool Hall Farm, a receptor identified in **PEI Report Volume 2 Part B Section 6 Chapter 11 Socio-economics, recreation and tourism**, has an office building that sits within the Section 5 Study Area. However, to avoid double counting of effects, the business as a whole is considered with **PEI Report Volume 2 Part B Section 6 Chapter 11 Socio-economics, recreation and tourism**.
- 11.5.12 **Table 11.3** below identifies the local businesses, including tourist accommodation that operate as businesses, which fall within the Study Area. These are also shown on **PEI Report Volume 2 Part B Section 5 Figure 11.1 – Local Business Receptors and Community Facilities Within the Study Area**.

Table 11.3 Local businesses within the Study Area

Receptor	Description	Sensitivity
Wigwam Holidays	At its closest point, this receptor is approximately	Medium

Receptor	Description	Sensitivity
	15m from the Refined Siting Zone boundary. The receptor is situated along Marsh Road.	
Wragg Marsh Farm: Contractors Hut	At its closest point, this receptor is approximately 15 m from the Refined Siting Zone boundary. The receptor is situated along Herons Way.	Low
Ball Colegrave Ltd (Horticultural Company)	At its closest point, this receptor is approximately 65 m from the Refined Siting Zone boundary. The receptor is situated along Marsh Road.	Medium
Flamingo Flowers Ltd	At its closest point, this receptor is approximately 200 m from the Refined Siting Zone boundary. This receptor is situated along Stone Gate.	Medium
The Chequers Inn	At its closest point, this receptor is approximately 240 m from the Refined Siting Zone boundary. This receptor is situated along High Road.	Medium

### Development Land

- 11.5.13 For the purposes of assessment, ‘development land’ includes existing and proposed land used for above ground renewable energy generation (solar and onshore wind farms), alongside development land allocations set out in local planning policy.
- 11.5.14 **Table 11.4** below describes key development land allocations and above-ground renewable energy generation infrastructure (solar and onshore wind farms) which fall within the Study Area. These are also shown on **PEI Report Volume 2 Part B Section 5 Figure 11.2 – Development Land Allocations and Open Space Within the Study Area**.
- 11.5.15 Generally, the allocations are strategic in nature and are therefore considered to have limited potential for substitution. As such they are considered to have a High sensitivity.

Table 11.4 Development land allocations within the Study Area

Local authority area	Receptor	Description	Sensitivity
South East Lincolnshire Local Plan	Lingarden Employment Site- WE001	Established Employment Site (WE001) in Weston of which 5.58 ha is protected for new B1, B2 and B8 development or B1, B2 and B8 redevelopment. At its closest point, the allocation is approximately 60 m from the Refined Siting Zone boundary.	High
South East Lincolnshire Local Plan	Housing Allocation – WSN022	Housing Allocation site area of 3.88 ha, total capacity yield of 60 dwellings, to the south of High Road. At its closest point, the allocation is approximately 260 m from the Refined Siting Zone boundary.	High

Local authority area	Receptor	Description	Sensitivity
South East Lincolnshire Local Plan	Weston Housing Allocation - WSN003	Weston Housing Allocation site area of 6.1 ha, total capacity yield of 135 dwellings, to the north of High Road, Weston. At its closest point, the allocation is approximately 80 m from the Refined Siting Zone boundary.	High
South East Lincolnshire Local Plan	Weston Housing Allocation – WSN029	Weston Housing Allocation site area of 2.83 ha, total capacity yield of 57 dwellings, off High Road, Weston. At its closest point, the allocation is approximately 90 m from the Refined Siting Zone boundary.	High

### Community Facilities

- 11.5.16 **Table 11.5** below identifies the community facilities which fall within the Study Area. These are also shown on **PEI Report Volume 2 Part B Section 5 Figure 11.1 – Local Business Receptors and Community Facilities Within the Study Area**.
- 11.5.17 Generally, the community facilities have some social and/or community value and would likely have limited potential for substitution in the immediately surrounding area, and as such should be considered to have a High sensitivity. The exceptions to this are the Post Offices situated on Small Drove and High Road. These receptors are considered to have a Medium sensitivity because there is some potential for substitution of these facilities.

Table 11.5 Community facilities within the Study Area

Receptor	Description	Sensitivity
Weston Post Office	At its closest point, this receptor is approximately 240 m from the Refined Siting Zone boundary. The receptor is situated along Small Drove.	Medium
Weston Hall and Premises situated along High Road	At its closest point, this receptor is approximately 470 m from the Refined Siting Zone boundary. The receptor is situated along High Road.	High
Weston Village Hall	At its closest point, this receptor is approximately 270 m from the Refined Siting Zone boundary. The receptor is situated along High Road.	High
Post Office along High Road	At its closest point, this receptor is approximately 230m from the Refined Siting Zone boundary. The receptor is situated along High Road.	Medium
St Marys Church	At its closest point, this receptor is approximately 250m from the Refined Siting Zone boundary. The receptor is situated along High Road.	High

## Open Space

- 11.5.18 Open space, which includes all open space of public value, can take many forms, from formal sports pitches to open areas within a development, linear corridors and country parks (Ref 13).
- 11.5.19 **Table 11.6** below identifies areas of open space, either allocated via the relevant local development plan or recognised as an area of green space by local communities, within the Study Area. These are also shown on **PEI Report Volume 2 Part B Section 5 Figure 11.2 Development Land Allocations and Open Space Within the Study Area**
- 11.5.20 It is noted that the Land at St Marys Church is considered to be an open space. However, this area of land, forms part of the religious ground (church) which has been considered as a community facility. As such, this area of open space has not been assessed separately to avoid double counting.

Table 11.6 Open space within the Study Area

Receptor	Description	Sensitivity
Tennis Court along the Weston Footpath	At its closest point, this receptor is approximately 125 m from the Refined Siting Zone boundary. The receptor is situated along the Weston Footpath.	Medium

## Users of Public Rights of Way (PRoW) and Promoted/recreational Routes

- 11.5.21 This section of the baseline considers people using PRoWs for walking, wheeling, cycling and horse riding. PRoWs have the same legal status and protection as highways and remain in existence until legally closed, diverted or extinguished. The PRoWs within the Study Area are shown on **PEI Report Volume 2 Part B Section 5 Figure 11.3 – PRoW and Promoted/Recreational Routes Within the Study Area**.
- 11.5.22 Promoted/recreational routes generally involve national cycle routes, the local cycle network, long-distance paths and national trails, which have also been identified within the Study Area. These have also been identified through the use of Lincolnshire County Council (Ref 11) and Weston Parish (Ref 12) definitive maps, and desk-top research. Such routes, paths and trails generally follow alignments utilising combinations of PRoW.
- 11.5.23 PRoWs are typically considered as:
- i. Public footpaths, open to walkers only;
  - ii. Public bridleways, open to walkers, cyclists and horse-riders;
  - iii. Restricted byways, open to walkers, cyclists, horse-riders, and drivers and riders of non-mechanically propelled vehicles (such as horse-drawn carriages); and
  - iv. Byways open to all traffic (BOATs), open to all including motor vehicles.
- 11.5.24 People using wheelchairs or mobility scooters can use all of the above designations.
- 11.5.25 Considering the potential sensitivity of these receptors, generally:

- i. National trails have a very high sensitivity because they are likely to be used for both commuting and recreational purposes, with daily/frequent use and the route has limited potential for substitution;
  - ii. Other promoted/recreational routes have a high sensitivity because they are likely to be well signed long distance/regional trails used daily/frequently for recreation; and
  - iii. Bridleways, footpaths, restricted byways and byways open to all traffic (BOATS) have a medium or low sensitivity because of their value to communities and subject to available alternative routes.
- 11.5.26 Relevant transport surveys are ongoing, which are reported in **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement**. At ES stage survey results will help further inform the consideration of sensitivity of routes by providing information about usage and condition, which are relevant to determining value and potential for substitution.
- 11.5.27 **Table 11.7** identifies the PRow and promoted/recreational routes in this Section by local authority area, its unique reference number relevant to the local authority definitive map(s), its proximity to the Project and its sensitivity. It should be noted that some PRow and recreational routes cross Section boundaries and they are reported within each of the Sections they are present within. To avoid the double counting of likely significant effects, where practicable, a receptor will only be assessed within the Section where there is the most adverse effect. Preliminary effects upon PRowS during construction of the Project are assessed within **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement**.

Table 11.7 PRow and promoted/recreational routes within the Study Area

Parish area	Receptor	Description	Sensitivity
<b>Promoted/recreational routes</b>			
N/A	MacMillan Way	This receptor is a long-distance footpath that links Boston to Abbotsbury in Dorset. The route is located within the Study Area and does not interact with the Refined Siting Zone boundary. The route is 290 miles in total length.	High
<b>Lincolnshire Country Council</b>			
Surfleet Civil Parish	3 BOATs: Surf/3/4, Surf/3/3, Surf/3/2 1 public bridleway: Surf/8/2	There are 3 BOATs and 1 public bridleway located within the Surfleet Civil Parish which interact with the Refined Siting Zone boundary.	Medium
Surfleet Civil Parish	1 BOAT: Surf/3/1 1 public bridleway: Surf/8/1 5 public footpaths: Pinc/9/2, Pinc/8/2,	There is 1 BOAT, 1 public bridleway, and 5 public footpaths located within the Surfleet Civil Parish which are located within the Study Area and do not interact with the Refined Siting Zone boundary.	Medium

Parish area	Receptor	Description	Sensitivity
	Pinc/8/3, Pinc/8/4, Pinc/9/1		
Pinchbeck Civil Parish	2 public footpaths: Pinc/10/1 and Pinc/9/3	There are 2 public footpaths located within the Pinchbeck Civil Parish that are located within the Study Area and do not interact with the Refined Siting Zone boundary.	Medium
Spalding Civil Parish	3 public bridleways: Spal/14/1, Spal/1063/1, and Spal/1064/1	There are 3 public bridleways within the Spalding Civil Parish that are located within the Study Area and do not interact with the Refined Siting Zone boundary.	Medium
The Moultons Civil Parish	1 public footpath: Moul/2/1	There is 1 public footpath located within the Moultons Civil Parish and that interacts with the Refined Siting Zone boundary.	Medium
Moultons Civil Parish	1 public bridleway: Moul/1/1  1 public footpath: Moul/2/2	There is 1 public bridleway and 1 public footpath located within the Moultons Civil Parish that are located within the Study Area and do not interact with the Refined Siting Zone boundary.	Medium
Weston Civil Parish	2 public bridleways: Wstn/6/2 and Wstn/4/1  3 public footpaths: Wstn/7/1, Wstn/8/1, and Wstn/3/1	There are 2 public bridleways and 3 public footpaths that are located within the Weston Civil Parish and is within the Refined Siting Zone boundary.	Medium
Weston Civil Parish	3 public bridleways: Wstn/6/1, Surf/9/1 and Wstn/5/1  1 public footpath: Wstn/2/1	There are 3 public bridleways and 1 public footpath that are located within the Study Area and do not interact with the Refined Siting Zone boundary.	Medium

## Aviation

- 11.5.28 This assessment has identified no airfields within 5 km of the centre of the Refined Siting Zone.

## Future Baseline

- 11.5.29 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.
- 11.5.30 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.

- 11.5.31 Population projections relevant to the local labour market and affected communities is considered as part of **Volume 2 Part C Route-wide Chapter 9 Socio-economics, recreation and tourism**, owing to the nature of the impacts which will be felt at a regional level.
- 11.5.32 The Spalding PV and Battery Energy Storage System (BESS) is a proposed development situated partly within the Study Area of Section 5, with a high sensitivity. It is also located within Section but as it is located primarily within defined Siting Zone boundary of Section 5 it is considered within this report.

## 11.6 Design, Control and Additional Mitigation Measures

### Design Mitigation Measures

- 11.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the 'Holford Rules' (Ref 14) applicable to routing of new overhead lines and the 'Horlock Rules' (Ref 15) 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 16) 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.
- 11.6.2 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of the substation(s) and the routeing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.

### Control Mitigation Measures

#### Construction

- 11.6.3 A Preliminary Code of Construction Practice (CoCP) is provided in **PEI Report Volume 3 Appendix 5A Initial Outline Code of Construction Practice**. The control measures included within the Preliminary CoCP relevant to the Socio-economic, recreation and tourism assessment of Section 5 include:
  - i. TT02: All affected 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 Public Right of Way Management Plan (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.
- ii. 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.
  - iii. GG08: Land used temporarily will be reinstated where practicable to its pre-construction condition (including Agricultural Land Classification (ALC) grade) and use. Hedgerows, fences, and walls (including associated earthworks and boundary features) will be reinstated to a similar style and quality to those that were removed, in consultation with the landowner.
  - 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.

## Additional Mitigation Measures

- 11.6.4 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.
- 11.6.5 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.

## 11.7 Preliminary Assessment of Effects

- 11.7.1 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, operation and/or maintenance activities within Section 5.
- 11.7.2 The preliminary assessment of effects reported below take into account the Design and Control mitigation measures as previously described.
- 11.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 11.8**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 11.7.4 This PEI Report has assumed that following the implementation of all Design, Control and Mitigation Measures there is unlikely to be a significant intra-project cumulative effect upon the amenity value of any Socio-economic, recreation and tourism receptors. This will be reviewed and updated accordingly at ES stage.
- 11.7.5 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 detailed assessment will be included within the ES submitted with the DCO application.

## Likely Significant Effects

### Construction, Operation and Maintenance

- 11.7.6 An assessment of the direct effects of the Project on above ground renewable energy generating infrastructure (solar and onshore wind farms) as Socio-economics, recreation and tourism receptors will be presented in the ES.
- 11.7.7 For this PEI Report, a reasonable worst-case scenario approach has been applied in relation to solar farms that intercept with the Refined Siting Zone boundary. Within Section 5 there is one receptor (Spalding PV and BESS project) considered in the Future Baseline. The assumption is that this receptor would be directly impacted and would therefore have potential for likely significant effects by virtue of potential temporary or permanent loss of land during construction.
- 11.7.8 The likely level of effect and magnitude of changes will be determined within the ES following completion of the relevant interrelated assessments and landowner consultation.
- 11.7.9 Based upon the preliminary assessment, no likely significant effects are predicted for the other Socio-economic, recreation and tourism receptors within Section 5, as a result of the construction or operation and maintenance phases of the Project.

## Likely Non-Significant Effects

### Construction

#### Local Businesses

- 11.7.10 In accordance with the wider Project design, Section 5 design development is following an approach that avoids direct impacts on local businesses. However, for local businesses identified within the Study Area, there is the potential for indirect and temporary effects arising from construction through presence of traffic, plant and machinery, and the erection of the overhead lines, construction of the substation(s) and associated works. This may cause access, dust, noise and vibration and visual effects as considered in other topic chapters in **PEI Report Volume 2 Part B Section 5** (please see **Chapter 9 Traffic and Movement, Chapter 12 Air Quality, Chapter 10 Noise and Vibration, and Chapter 3 Visual**) and **PEI Report Volume 2 Part C Route-wide Assessments (Chapter 10 Health and Wellbeing)**. It is acknowledged that in-combination, the environmental conditions and character of local businesses may be temporarily affected as a result of construction related disturbance. At this stage it is anticipated that impacts associated with construction activities on local businesses would generally be small. The resulting effect would be minor adverse and temporary, following the implementation of the Control Mitigation Measures as previously outlined within this chapter and other interrelated topic chapters. The resulting effects on the high and medium value receptors are not anticipated to be significant.

## Development Land

- 11.7.11 There are three areas of land allocated for housing development, under the South East Lincolnshire Local Plan; WSN003, WSN022, WSN029 which at their closest point, are 60 m from the Refined Siting Zone boundary. Furthermore, the Lingarden Employment Site (WE001) is also located 60m from the Refined Siting Zone boundary.
- 11.7.12 In accordance with the wider Project design, design development is following an approach that avoids direct impacts on this development land as land take from these allocations is not expected to be required to facilitate the design of Section 5. It is acknowledged that the construction stage of the Project could lead to a temporary change in the environment that may have a small, adverse impact on the amenity value of the land allocated for new housing and employment development, however, effects are not considered to be significant as the Project would not preclude the development of land allocated for housing and employment. It is not anticipated that the design of Section 5 would affect the viability of the allocation following construction. It is also assumed that access would be maintained at all times. Permanent effects upon these development allocations arising from construction of the Project are therefore not anticipated to occur.
- 11.7.13 At this stage it is anticipated that impacts associated with construction activities on development land would generally be small. The resulting effect would be minor adverse and temporary, following the implementation of the Control Mitigation Measures as previously outlined within this chapter and other interrelated topic chapters. The resulting effects on the high value receptors are not anticipated to be significant.
- 11.7.14 National Grid and site promoters are continuing to engage in relation to the Project, and an update will be provided at ES stage. There are no direct or likely significant effects anticipated as a result of the design of Section 5, due to no land take of development allocations which would allow them to continue to be developed in line with planning policy. However, there is currently an insufficient level of detail to inform an assessment of likely indirect effects during construction. Any ongoing engagement with the landowner will seek to better understand any potential mitigation to reduce the impact as far as possible and practicable. Any such measures will be reported within the ES.

## Community Facilities

- 11.7.15 In accordance with the wider Project design, Section 5 design development is following an approach that avoids direct impacts on community facilities. However, there is the potential for indirect and temporary effects upon community facilities arising from construction through presence of traffic, plant and machinery, and the erection of the overhead lines, construction of the substation(s) and associated works. This may cause access, dust, noise and vibration and visual effects as considered in other topic chapters in **PEI Report Volume 2 Part B Section 5** (please see **Chapter 9 Traffic and Movement, Chapter 12 Air Quality, Chapter 10 Noise and Vibration, and Chapter 3 Visual**) and **PEI Report Volume 2 Part C Route-wide Assessments (Chapter 10 Health and Wellbeing)**. It is acknowledged that in combination, the environmental conditions and character of community facilities may be temporarily affected by construction activities for Section 5.
- 11.7.16 At this stage it is anticipated that impacts associated with construction activities on community facilities would generally be small adverse and the resulting effect would

minor adverse and temporary, following the implementation of the mitigation measures as previously outlined. The resulting effects on the high and medium value receptors are not anticipated to be significant.

### Open Space

- 11.7.17 In accordance with the wider Project design, Section 5 design development is following an approach that avoids direct impacts on open space. However, there is the potential for indirect and temporary effects upon the identified open space receptor arising from construction through presence of traffic, plant and machinery, and the erection of the overhead lines, construction of the substation(s) and associated works. This may cause access, dust, noise and vibration and visual effects as considered in other topic chapters in **PEI Report Volume 2 Part B Section 5** (please see **Chapter 9 Traffic and Movement, Chapter 12 Air Quality, Chapter 10 Noise and Vibration, and Chapter 3 Visual**) and **PEI Report Volume 2 Part C Route-wide Assessments (Chapter 10 Health and Wellbeing)**. It is acknowledged that in-combination, the environmental conditions and character of the open space receptor may be temporarily affected by construction activities for Section 5. At this stage it is anticipated that impacts associated with construction activities would generally be small. The resulting effect would be minor adverse and temporary, following the implementation of the Control Mitigation Measures as previously outlined within this chapter and other interrelated topic chapters. The resulting effects on the medium value receptor is not anticipated to be significant.

### Users of PRowS and Promoted/recreational Routes

- 11.7.18 An assessment of the direct effects of the Project on users of PRow and promoted/recreational routes in relation to diversions, closures and management measures will be presented at ES stage in **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement**. This Socio-economics, recreation and tourism assessment, also at ES stage, will consider the in-combination effects of any proposed diversions and/or closures and changes to amenity value resulting from noise, visual and air quality impacts. The likely significance of effects will be determined at ES stage when the necessary information from all relevant topic specialists is available and confirmed, to help inform determination of the receptors' magnitude of change.

### Operation and Maintenance

- 11.7.19 As outlined in the Scoping Report (Ref 5) the effects of the Project's operation and maintenance phases on the receptor groups outlined in **Table 11.8** are not likely to give rise to significant effects and are therefore scoped out of the assessment.
- 11.7.20 Once operational, on-site activity within Section 5 would generally be limited to regular inspection and maintenance. No likely significant effects are therefore expected during the operation and maintenance of the Project for Section 5, subject to further design development.

Table 11.8 Preliminary summary of non-significant Socio-economic, recreation and tourism effects – Section 5

Receptor	Impact	Sensitivity/Importance/Value of Receptor	Magnitude of Change	Significance	Rationale
Local businesses	Local business receptors are located approximately 15 -240m from the Refined Siting Zone boundary and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Low-Medium	Small, adverse	Minor adverse, not significant	It is considered that this receptor group possess some economic value and has potential for substitution. It has therefore been assigned Low-Medium sensitivity. It is anticipated that there would be a Small change likely given Wragg Marsh Farm and Wigwam Holiday's proximity to the Refined Siting Zone boundary, with details of visual amenity impacts uncertain until detailed design for Section 5. However, Section 5 proposals are unlikely to impact the viability of local business operations, and it is further assumed that access would be maintained at all times.
Development land	Development land receptors are located approximately 60 -260m from the Refined Siting Zone boundary and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	Development land allocations are strategic in nature and are therefore considered to have limited potential for substitution, and as such this receptor group has been assigned a High sensitivity. It is anticipated that there would be a Small change likely by virtue of their proximity within

Receptor	Impact	Sensitivity/Importance/Value of Receptor	Magnitude of Change	Significance	Rationale
					the Refined Siting Zone boundary, although it is not anticipated that this would affect the viability of the allocation following construction. It is also assumed that access would be maintained at all times.
Community facilities	Community facility receptors are located approximately 230 -470m from the Refined Siting Zone boundary and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	High	Small, adverse	Minor adverse, not significant	Community facilities have some social and/or community value and would likely have limited potential for substitution in the immediate surrounding area and are therefore assigned a High sensitivity. It is anticipated that a Small change would be felt, given likely construction activities in the surrounding areas. It is also assumed that access would be maintained at all times.
Open Space	The Open space receptor is located approximately 125 m from the Refined Siting Zone boundary and may be affected from adverse noise/vibration, air quality/dust, and visual impacts during construction.	Medium	Small, adverse	Minor adverse, not significant	The identified Open space receptor has some social and/or community value, but has potential for substitution, and is therefore considered to have a Medium sensitivity. It is anticipated that there would be a Small change felt, given likely construction activities in the surrounding areas. It is

Receptor	Impact	Sensitivity/Importance/Value of Receptor	Magnitude of Change	Significance	Rationale
					also assumed that access would be maintained at all times.

## **11.8 Monitoring**

- 11.8.1 The control measures set out in section 11.6 will secure a PRoWMP as part of the Preliminary CoCP. No further monitoring requirements have been identified at the time of writing over and above this requirement for the Socio-economic, recreation and tourism assessment. This will be reviewed and updated accordingly as part of the ES.



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# 12. Air Quality

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# 12. Air Quality

## 12.1 Introduction

- 12.1.1 This chapter presents the Preliminary Environmental Information (PEI) in relation to the Air Quality assessment for the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5) of the Grimsby to Walpole Project (the Project).
- 12.1.2 The assessment for Section 5 is based on a Refined Siting Zone boundary, as the proposed design is yet to be determined. Subsequently, the PEI for Section 5 contains less design information than other Sections of the Project and does not define draft Order Limits 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.
- 12.1.3 Specifically, the chapter includes the following sections:
- i. An introduction to the topic (section 12.1);
  - ii. Identification of key local and regional policy relevant to the assessment (section 12.2). 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 resulting scope of the Air Quality assessment (section 12.3). 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 Air Quality assessment within Section 5 (section 12.4). 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 Section 5 Study Area relevant to the Air Quality assessment (section 12.5);
  - vi. A description of mitigation measures included for the purposes of the Air Quality assessment reported within the PEI Report (section 12.6). 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 Air Quality effects arising during construction and operation of the Project within the Section 5 Study Area, based upon the assessment completed to date (section 12.7); and

viii. An outline of the proposed monitoring requirements in relation to air quality (section 12.8).

12.1.4 Further supporting information is set out in **Table 12.1**, including supporting figures and technical appendices.

Table 12.1 Supporting documentation

<b>Supporting Information</b>	<b>Description</b>
<b>Topic Specific Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Figures</b>	<b>Figure 12.1 Construction Dust Study Area</b> <b>Figure 12.2 Preliminary Affected Road Network and Local Authority Monitoring Locations</b>
<b>Project Supporting Documentation</b>	
<b>PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project</b>	A summary of the emerging Project design within Section 5 including the likely permanent infrastructure (assuming two substation(s) as a worst case), the likely construction stages and phasing and; the operational activities. The chapter includes a series of design assumptions for the Project, given that the PEI relating to Section 5 is based on a Refined Siting Zone boundary rather than defined draft Order Limits and the proposed design is yet to be determined.
<b>PEI Report Volume 3 Part A Appendix 2A Key Legislation</b>	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).
<b>PEI Report Volume 3 Part A Appendix 2B National and Regional Planning Policy</b>	A list of national and regional policies generally applicable to the assessment principles which underpin the PEI Report and ES.
<b>PEI Report Volume 3 Part A Appendix 2Ci Local Plan Policy: Section Specific</b>	An outline of the potentially relevant local planning policy allocations affecting each of the specific sections of the Project.
<b>PEI Report Volume 3 Part A Appendix 2Cii Local Plan Policy: Route-wide</b>	Details of planning policies applicable route-wide within the relevant Local Authority areas.
<b>PEI Report Volume 2 Part A Chapter 3 Main Alternatives Considered</b>	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.
<b>PEI Report Volume 2 Part A Chapter 4 Approach to Preliminary Environmental Information</b>	Sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the PEI Report for the Project.

Supporting Information	Description
<b>PEI Report Volume 2 Part A Chapter 5 Project Description</b>	An overarching description of the Project and its key components, including available construction information.
<b>PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice</b>	Sets out control and management measures that will be undertaken during construction of the Project if granted consent. The final Code of Construction Practice (CoCP) will be submitted in support of the Development Consent Order (DCO) application.

- 12.1.5 There are also interrelationships between the potential effects on Air Quality 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 5 Chapter 4 Ecology and Biodiversity** assesses the potential for changes in Air Quality to effect ecological receptors, such as increases in pollutant concentrations or dust deposition.
  - ii. **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement** assesses the potential change in traffic movements during construction and operation, which are relevant to the assessment of Air Quality effects associated with vehicle emissions.
  - iii. **PEI Report Volume 2 Part B Section 5 Chapter 11 Socio-economics, Recreation and Tourism** assesses potential effects upon local businesses and recreational areas that could be affected by changes in air quality acting in combination with other impacts.
  - iv. **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary** provides a concise, consolidated summary of the likely significant effects reported for all topics, based upon the preliminary assessment .
  - v. **PEI Report Volume 2 Part C Route-wide Chapter 8 Health and Wellbeing** assesses the potential effects of changes in Air Quality upon health and wellbeing.
  - vi. **PEI Report Volume 2 Part C Route-wide Chapter 10 Cumulative Effects** reports those intra-project effects which could potentially act in combination to result in cumulative environmental effects. It also 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.

## 12.2 Legislation and Policy Framework

### Legislation and National Policy

- 12.2.1 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, details of which are set out in **Table 12.1**.

## Regional and Local Policy

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

- i. South East Lincolnshire Local Plan 2011-2036 (Adopted 2019) (Ref 1) which covers the administrative areas of both Boston Borough and South Holland District Councils:
  - Policy 30 – Pollution: development proposals will not be permitted should they lead to unacceptable adverse impacts upon air quality; and
  - Policy 31 – Climate Change and Renewable and Low Carbon Energy: Developments must demonstrate consequences of current climate change has been addressed, minimised and mitigated through the protection of air quality.

## 12.3 Scope of Assessment

12.3.1 The scope of the assessment 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 EIA Scoping Report (Ref 3). A summary of the Scoping Opinion together with a response against each point of relevance to the Air Quality chapter is provided in **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**.

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

12.3.3 The scope of the Air Quality assessment considers the impact of:

- i. Dust from on-site construction activities (including enabling works) and off-site trackout by construction vehicles on sensitive (human and ecological) receptors. The main potential impacts are dust soiling (which can lead to the loss of amenity) and the deterioration of human health (as a result of increases in concentrations of Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>)); and
- ii. Vehicular tail-pipe emissions containing air pollutants released by construction, operation and maintenance vehicles associated with the Project using the local road network. The emissions from vehicles include but are not limited to Nitrogen Oxides (NO<sub>x</sub>) (comprising Nitrogen Monoxide, NO, and Nitrogen Dioxide, NO<sub>2</sub>), Ammonia (NH<sub>3</sub>) and Particulate Matter (PM<sub>10</sub> and PM<sub>2.5</sub>). Emissions from vehicles also include those associated with brake and tyre wear.

12.3.4 The projected number, type and location of plant and Non-Road Mobile Machinery (NRMM), as well information on the duration and change in traffic flows associated with planned diversions including proposed routes, are yet to be determined. An assessment of any associated effects will be included in the ES, in accordance with the Scoping Opinion (Ref 2). However, these details are not included within the PEI Report and as such no assessment of NRMM emissions and planned traffic diversions has been completed at this stage.



## 12.4 Assessment Methodology

- 12.4.1 The assessment scope, methodology, relevant guidance, key assumptions and limitations for the Air Quality 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 described and assigned in the assessment. A summary of the key components is provided below.
- 12.4.2 This PEI Report chapter presents a baseline appraisal of air quality within Section 5. It assesses the impact of dust and PM<sub>10</sub> on human and ecological receptors before concluding whether the effects are likely to be significant or not.
- 12.4.3 The assessment of construction dust impacts has been undertaken in line with Institute of Air Quality Management (IAQM) Guidance on the Assessment of Dust from Demolition and Construction (Ref 4). This guidance provides a risk-based approach to the assessment of the potential for dust impacts from four types of activities taking account of the sensitivity of the environment surrounding the works: demolition; earthworks; construction; and trackout (the movement of dust/mud onto the public highway via construction vehicles) on sensitive (human and ecological) receptors.
- 12.4.4 For the purposes of the PEI Report, an initial screening assessment of construction traffic flows has been completed based on preliminary construction traffic projections. Projected changes in Annual Average Daily Traffic (AADT) flows for both Light Goods Vehicles (LGVs) and Heavy Goods Vehicles (HGVs) have been screened to determine where detailed assessment (using dispersion modelling) is likely to be required, the findings of which will be reported in the ES submitted with the DCO application. This screening exercise is intended to provide an indication of where there is greatest potential for changes in air quality as a result of construction traffic, but it is noted that no dispersion modelling has been completed at this stage.
- 12.4.5 The impact of construction traffic vehicle emissions on sensitive (human and ecological) receptors within 200 m of affected roads will be considered, beyond this distance no significant effects are expected (Ref 5).
- 12.4.6 Where changes in traffic flows resulting from the construction of the Project meet the assessment criteria within the Environmental Protection UK (EPUK)/IAQM Land Use Planning & Development Control guidance (Ref 6), and set out below, then detailed dispersion modelling will be undertaken to determine the impact on existing human sensitive receptors:
- i. a change in Light Duty Vehicle (LDV)<sup>1</sup> flows of more than 100 Annual Average Daily Traffic (AADT, vehicles/day) within or adjacent to an Air Quality Management Area (AQMA) or more than 500 AADT elsewhere; and
  - ii. a change in Heavy Duty Vehicle (HDV) (>3.5 tonnes)<sup>2</sup> flows of more than 25 AADT within or adjacent to an AQMA or more than 100 AADT elsewhere.
- 12.4.7 Based on an initial review of the draft Order Limits and the existing road network that may be used by construction traffic to access the Project, the assessment of vehicle emission impacts on ecological sensitive receptors within 200 m of the affected roads

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<sup>1</sup> Light Duty Vehicles = cars and Light Goods Vehicles (LGVs).

<sup>2</sup> Heavy Duty Vehicles = Heavy Goods Vehicles (HGVs) plus Public Service Vehicles, e.g., buses and coaches.

may be required as there are a number of road links where the predicted change in HDV flows (of 200 AADT) exceeds the change criteria outlined within the IAQM's Guide to the Assessment of Air Quality Impacts on Designated Nature Conservation Sites (Ref 7). There are no road links where the projected change in total traffic (LDV + HDV) flows exceeds the 1000 AADT criteria also given in the IAQM guidance.

- 12.4.8 An initial review of operation/maintenance vehicle movements associated with the Project has also been undertaken against the EPUK/IAQM screening criteria described above (Ref 6) for human sensitive receptors and the IAQM criteria (Ref 7) for ecological sensitive receptors.
- 12.4.9 Once updated construction and operational/maintenance traffic data is made available, projected changes in traffic flows as a result of the Project will be re-screened against the criteria within the EPUK/IAQM and IAQM guidance. A detailed assessment of impacts will be undertaken where traffic flows exceed the criteria and reported within the ES.

## Assessment Assumptions and Limitations

- 12.4.10 The Section 5 design assumptions and limitations, which have informed the assessment for all topics are listed within **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 12.4.11 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**. In addition to these, the following Section 5 specific Air Quality assessment assumption and limitation has been applied.
- 12.4.12 The construction dust assessment has been undertaken using the Refined Siting Zone boundary, as the draft Order Limits have not yet been determined for Section 5. The Refined Siting Zone extends over a greater area than the draft Order Limits would be expected to cover and therefore presents a worst case assessment. Once the draft Order Limits within Section 5 are determined, it is likely that a reduced number of receptors will be located within the updated Section 5 Study Area.
- 12.4.13 These key parameters and assumptions which inform the assessment 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.

## 12.5 Baseline Conditions

### Study Area

#### Construction Dust

- 12.5.1 For construction phase dust impacts, the assessment Study Area has been defined by the screening criteria from the IAQM guidance (Ref 4) and additional guidance given by Natural England during the Scoping Opinion (Ref 2). The construction dust Study Area is shown within **PEI Report Volume 2 Part B Section 5 Figure 12.1 Construction Dust Study Area** and is dictated by the screening criteria below:

- i. human receptors within the Refined Siting Zone boundary plus those within the surrounding area extending 250 m from the Refined Siting Zone boundary, or within 50 m of the proposed routes used by construction traffic on the public highway or up to 250 m from a site entrance; and
- ii. ecological designated sites within the Refined Siting Zone boundary plus those within the surrounding area extending 200 m from the Refined Siting Zone boundary, or within 50 m of the proposed routes used by construction traffic on the public highway up to 250 m from a site entrance. The 200 m screening distance from the draft Order Limits is more conservative than that stipulated in the IAQM guidance (Ref 4), and has been used following the advice given by Natural England within their Scoping Opinion consultation response (Ref 2).

12.5.2 Background NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> concentrations presented in the baseline assessment for the existing and future years have been extracted from Defra's background maps<sup>3</sup> (Ref 8) for the area extending 500 m from the Refined Siting Zone boundary.

12.5.3 Where ecological receptors have been identified within 200 m of the Refined Siting Zone boundary, baseline data for pollutants which affect nutrient nitrogen deposition, such as NH<sub>3</sub> concentrations and nitrogen deposition rates, have been taken from Air Pollution Information System (APIS) (Ref 9), along with acid deposition rates and the relevant critical levels and loads for the designated sites.

### Road Traffic Emissions

12.5.4 The Section 5 Study Area for the assessment of impacts upon human receptors due to road traffic emissions associated with the Project has been defined with reference to the criteria given in the EPUK/IAQM guidance described in section 12.4 Methodology (Ref 6). The Section 5 Study Area comprises any roads where these criteria are exceeded, and any human receptors within 200 m of these roads. The Section 5 Study Area described within this chapter will be updated as required for the ES, based upon further analysis of traffic projections for the Project.

12.5.5 The Section 5 Study Area for the assessment of impacts upon ecological receptors due to road traffic emissions associated with the Project includes ecological sensitive receptors within 200 m of any road links where the projected changes in traffic flow exceed IAQM guidance thresholds (Ref 7).

12.5.6 Roadside concentrations from local authority monitoring sites within 200 m of the routes within the Section 5 Study Area that are expected to be used by construction and operational/maintenance traffic have therefore been used to determine baseline conditions.

### Data Collection

12.5.7 The following data has been used to inform the baseline conditions along with those outlined in **PEI Report Volume 2 Part A Chapter 5 Project Description**:

- i. Defra's Background Maps (based on a 2021-base year) (Ref 8);

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<sup>3</sup> Defra's background maps of modelled air pollutant concentrations are provided on a 1 km x 1 km basis for the whole of the UK. To capture the grid squares that fall within the Refined Siting Zone Boundary and those immediately adjacent, a 500 m buffer has been applied.

- ii. Air Pollution Information System (APIS) (Ref 9);
- iii. Defra's AQMA dataset (Ref 10);
- iv. Defra's Multi-Agency Geographic Information for the Countryside (MAGIC) (Ref 11);
- v. Local authority Air Quality Management Reports (Ref 12);
- vi. Ordnance Survey (OS) AddressBase Plus dataset;
- vii. Google Earth Imagery; and
- viii. Data on Part A1<sup>4</sup> Permitted Installations held by the Environment Agency and Part A2 and B<sup>5</sup> Installations held by the local authorities within the Section 5 Study Area (Ref 13, Ref 14).

12.5.8 As previously stated, preliminary projections of changes in traffic flow as a result of the Project have been used to complete an initial screening exercise. Further detail regarding traffic data is provided within **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement** and supporting appendices.

## Existing Baseline

- 12.5.9 The following section outlines the Air Quality baseline for the Section 5 Study Area. There are two main potential sources of air pollution associated with the Project, construction dust emissions and construction road traffic emissions. The baseline presented is therefore based upon an assessment of likely background concentrations of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> taken from Defra's modelled data and a review of available local authority monitoring data.
- 12.5.10 The baseline section should be read in conjunction with **PEI Report Volume 2 Part B Section 5 Figure 12.1 Construction Dust Study Area**.
- 12.5.11 The Section 5 Study Area is predominantly rural in nature and the land use is mostly agricultural. The settlement of Moulton Seas End is located to the east of the Refined Siting Zone boundary and Weston is situated to the south. **PEI Report Volume 2 Part B Section 5 Figure 12.1 Construction Dust Study Area** demonstrates that the assessed sensitive receptor locations across the Section 5 Study Area are either at the extents of these and other small settlements, closest to the Refined Siting Zone boundary, or represent individual scattered properties within the wider rural area. These properties include those located in several small hamlets and individual agricultural holdings. The baseline presented is based upon an assessment of likely background concentrations of NO<sub>2</sub> and PM<sub>10</sub> taken from Defra's modelled data and a review of available local authority monitoring data across the Section 5 Study Area.
- 12.5.12 There are three designated ecological sites identified within Section 5 Study Area, Surfleet Bank Local Wildlife Site, to the northwest, and Surfleet Seas End Saltmarsh and Vernatt's Drain Local Wildlife Sites, to the west of the Refined Siting Zone which are sensitive to effects due to construction dust.

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<sup>4</sup> Large-scale industrial processes emitting to land, air and/or water.

<sup>5</sup> This would relate to smaller industrial processes regulated by the Local Authority under the Pollution Prevention and Control guidance, including Part A2 processes (which may release to land, air and water) or Part B processes (which only release to air).

## Local authority Air Quality Monitoring Data

- 12.5.13 Section 5 is located within the administrative area of South Holland District Council (SHDC).
- 12.5.14 SHDC's 2024 Annual Status Report (ASR) states that there are no AQMAs within their administrative area (Ref 12). SHDC measure pollutant concentrations for NO<sub>2</sub>, PM<sub>10</sub> and Ozone (O<sub>3</sub>).
- 12.5.15 Monitoring of annual mean NO<sub>2</sub> levels is undertaken by SHDC using a network of passive diffusion tubes and automatic monitoring stations and is reported in the SHCD 2024 ASR (Ref 12) which presents the concentrations from the calendar years 2019-2023. The locations and annual mean NO<sub>2</sub> concentrations of roadside diffusion tubes in SHCD's administrative areas that are within 200 m of construction traffic routes are presented in **Table 12.2** and shown in **PEI Report Volume 2 Part B Section 5 Figure 12.2 Preliminary Affected Road Network and Local Authority Monitoring Locations**.
- 12.5.16 **Table 12.2** shows that concentrations decreased from 2019 to 2020 before increasing in 2021 and 2022 (as consistent with national trends due to behavioural change during coronavirus lockdowns). All concentrations decreased between 2022 and 2023, with an overall trend of decreasing concentrations between 2019 and 2023. There are no exceedances of the Air Quality Objective (AQO) seen within the scoped-in monitoring locations.

Table 12.2 Section 5 Local Authority NO<sub>2</sub> monitoring data

ID	Location	Distance to Refined Siting Zone Boundary (km)	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )				
			2019	2020	2021	2022	2023
SH5	Station Road	5.2	27.9	20.9	23.8	27.6	24.3
SH6	Boston Rd A17	10.7	26.4	20.0	19.5	21.6	18.3
SH7	Gedney A17	9.5	15.5	12.7	14.3	14.4	13.6
SH19 (formerly SH14)	Whaplode	4.3	17.0	12.1	13.4	13.6	12.3
SH16	Gosberton	4.0	20.3	18.7	19.0	22.2	19.6
<b>Air Quality Objective</b>			<b>40</b>				

- 12.5.17 SHDC undertakes monitoring of PM<sub>10</sub> at two locations, however only monitoring station ID CM1, which is an urban background site within Spalding, has been deemed representative of the conditions within the Section 5 Study Area due to its proximity. Data from this location is shown in **Table 12.3**.

Table 12.3 Section 5 Local Authority PM<sub>10</sub> monitoring data

ID	Location	Distance to Refined Siting Zone Boundary (km)	Annual Mean NO <sub>2</sub> Concentration (µg/m <sup>3</sup> )				
			2019	2020	2021	2022	2023
CM1	Spalding Monkhouse School	4.4	13.7	10.9	9.0	11.5	10.9
<b>Air Quality Objective</b>			<b>40</b>				

12.5.18 The PM<sub>10</sub> data shows similar trends to those seen in the NO<sub>2</sub> data. There have been no exceedances of the AQO between 2019 and 2023.

12.5.19 25 permitted industrial sources have been identified within 2 km of the Refined Siting Zone (Ref 13, Ref 14). However, the identified permitted industrial sources are unlikely to substantially contribute to dust and PM<sub>10</sub> levels within the Section 5 Study Area, as those present will have limits on emissions to air imposed by the relevant regulator. These sources are represented within the background concentrations outlined within **Table 12.4**.

#### Background Air Quality Data

12.5.20 **Table 12.4** displays the arithmetic mean, minimum and maximum of modelled annual mean background pollutant concentrations of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub>, and PM<sub>2.5</sub> for 2024 within the Section 5 Study Area (Ref 8).

Table 12.4 2024 modelled Defra background concentrations within the Section 5 Study Area

Average (Minimum - Maximum) 2024 Annual Mean Concentration (µg/m <sup>3</sup> )			
NO <sub>x</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
7.4 (6.9 - 9.6)	5.9 (5.5 - 7.5)	13.4 (12.6 - 13.7)	6.0 (5.9 - 6.2)

12.5.21 The background concentrations of NO<sub>2</sub> and PM<sub>10</sub> are generally low within the Section 5 Study Area, given they are under half of the limit value of 40 µg/m<sup>3</sup> for both pollutants.

12.5.22 Background NO<sub>x</sub> concentrations (relevant to ecological receptors) are also generally low within the Section 5 Study Area. There are three designated ecological sites of local importance within the Section 5 Study Area. However, the average NO<sub>x</sub> concentration across the Section 5 Study Area is 7.4 µg/m<sup>3</sup> which falls below the critical level for the protection of vegetation of 30 µg/m<sup>3</sup>.

12.5.23 Concentrations of PM<sub>2.5</sub> are below the relevant limit value (20 µg/m<sup>3</sup>) where the average concentration within the Section 5 Study Area is 6.0 µg/m<sup>3</sup>. PM<sub>2.5</sub> is the pollutant for which background concentrations are closest to the limit value in 2024.

12.5.24 **Table 12.5** below shows the NH<sub>3</sub> critical level and concentration, nitrogen and acid deposition rates and critical loads for the designated ecological sites identified within the Section 5 Study Area.

Table 12.5 Ammonia critical level and concentration, nitrogen and acid deposition rates and critical loads for the ecological sites within the Section 5 Study Area

Ecological Site (Grid Reference X, Y)	2020 - 2022 Average Concentration					
	Ammonia Critical Level ( $\mu\text{g}/\text{m}^3$ )*	Ammonia Concentration ( $\mu\text{g}/\text{m}^3$ )	Nitrogen Deposition Rate (kg N/ha/yr)	Nitrogen Critical Load Range (kg N/ha/yr)	Acid Deposition Rate (keq/ha/yr)	Acid Critical Load (CLmaxS/ CLminN/ CLmaxN) (keq/ha/yr)
<b>Surfleet Bank (Local Wildlife Site)<sup>1</sup></b>						
528500, 330500	1 - 3	1.66	15.52	10 - 15	1.02 (N:1.11   S: 0.11)	4 / 1.071 / 5.071
529500, 330500	1 - 3	1.64	15.43	10 - 15	1.01 (N:1.1   S: 0.11)	4 / 1.071 / 5.071
528500, 330500	1 - 3	1.66	15.52	10 - 15	1.02 (N:1.11   S: 0.11)	4 / 1.071 / 5.071
529500, 330500	1 - 3	1.64	15.43	10 - 15	1.01 (N:1.1   S: 0.11)	4 / 1.071 / 5.071
<b>Surfleet Seas End Saltmarsh (Local Wildlife Site)<sup>2</sup></b>						
527500, 327500	1 - 3	1.65	15.45	10 - 20	1.02 (N:1.1   S: 0.12)	N/A
527500, 328500	1 - 3	1.66	15.5	10 - 20	1.02 (N:1.11   S: 0.12)	N/A
528500, 328500	1 - 3	1.63	15.44	10 - 20	1.02 (N:1.1   S: 0.12)	N/A
528500, 329500	1 - 3	1.64	15.48	10 - 20	1.02 (N:1.11   S: 0.11)	N/A
<b>Vernatt's Drain (Local Wildlife Site)<sup>3</sup></b>						
521500, 322500	N/A	1.91	16.31	N/A	1.12 (N:1.17   S: 0.12)	N/A
522500, 322500	N/A	1.9	16.4	N/A	1.12 (N:1.17   S: 0.12)	N/A



Ecological Site (Grid Reference X, Y)	2020 - 2022 Average Concentration					
	Ammonia Critical Level (µg/m <sup>3</sup> )*	Ammonia Concentration (µg/m <sup>3</sup> )	Nitrogen Deposition Rate (kg N/ha/yr)	Nitrogen Critical Load Range (kg N/ha/yr)	Acid Deposition Rate (keq/ha/yr)	Acid Critical Load (CLmaxS/ CLminN/ CLmaxN) (keq/ha/yr)
522500, 323500	N/A	1.88	16.26	N/A	1.11 (N:1.16   S: 0.12)	N/A
523500, 323500	N/A	1.88	16.16	N/A	1.1 (N:1.15   S: 0.12)	N/A
523500, 324500	N/A	1.86	16.03	N/A	1.09 (N:1.15   S: 0.12)	N/A
524500, 324500	N/A	1.82	15.94	N/A	1.08 (N:1.14   S: 0.12)	N/A
525500, 324500	N/A	1.78	15.84	N/A	1.07 (N:1.13   S: 0.12)	N/A
525500, 325500	N/A	1.75	15.75	N/A	1.06 (N:1.12   S: 0.12)	N/A
526500, 325500	N/A	1.72	15.67	N/A	1.05 (N:1.12   S: 0.12)	N/A
526500, 326500	N/A	1.69	15.59	N/A	1.04 (N:1.11   S: 0.12)	N/A
526500, 327500	N/A	1.67	15.5	N/A	1.03 (N:1.11   S: 0.12)	N/A
527500, 327500	N/A	1.65	15.45	N/A	1.02 (N:1.1   S: 0.12)	N/A
527500, 328500	N/A	1.66	15.5	N/A	1.02 (N:1.11   S: 0.12)	N/A
528500, 328500	N/A	1.63	15.44	N/A	1.02 (N:1.1   S: 0.12)	N/A
528500, 329500	N/A	1.64	15.48	N/A	1.02 (N:1.11   S: 0.11)	N/A

Note:

2020 - 2022 Average Concentration						
Ecological Site (Grid Reference X, Y)	Ammonia Critical Level ( $\mu\text{g}/\text{m}^3$ )*	Ammonia Concentration ( $\mu\text{g}/\text{m}^3$ )	Nitrogen Deposition Rate (kg N/ha/yr)	Nitrogen Critical Load Range (kg N/ha/yr)	Acid Deposition Rate (keq/ha/yr)	Acid Critical Load (CLmaxS/ CLminN/ CLmaxN) (keq/ha/yr)

\*The  $\text{NH}_3$  critical level is  $3 \mu\text{g}/\text{m}^3$  unless lichens and bryophytes are known to be present in which case it reduces to  $1 \mu\text{g}/\text{m}^3$ .

<sup>1</sup>The habitat has been defined as neutral grassland.

<sup>2</sup>The habitat has been defined as coastal saltmarsh. There is no comparable acid critical load class for which the CL function is calculated.

<sup>3</sup>The habitat is a watercourse for which APIS does not provide critical levels or loads.

N/A denotes no data available.

- 12.5.25 **Table 12.5** shows that the average NH<sub>3</sub> concentrations is estimated to be above the lower critical level of 1 µg/m<sup>3</sup> at all sites. The nitrogen deposition is over the lower critical load at Surfleet Seas End Saltmarsh (coastal saltmarsh), and above the upper critical load at Surfleet Bank (neutral grassland). The total acid deposition is below the minimum critical load for Surfleet Bank (neutral grassland).

### Summary

- 12.5.26 Overall, the Air Quality in the Section 5 Study Area is very good. There are no exceedances of the annual mean NO<sub>2</sub> or PM<sub>10</sub> objective in the Local Authority monitoring data and the background concentrations within the Section 5 Study Area are low in comparison to the Air Quality objectives.
- 12.5.27 There are habitats in the Section 5 Study Area where current predicted NH<sub>3</sub> concentrations are above their respective lower critical level and acid deposition rates above their respective maximum critical loads, whereas nutrient nitrogen deposition rates are above the respective critical load for neutral grassland.

### Future Baseline

- 12.5.28 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 the construction of the Project.
- 12.5.29 At this preliminary stage, a full assessment of the implications of any committed 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 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A 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.
- 12.5.30 Projected background air pollutant concentrations available from a base year of 2021 (Ref 8) have been used to determine future baseline conditions. Levels of NO<sub>x</sub>, NO<sub>2</sub>, PM<sub>10</sub> and PM<sub>2.5</sub> are predicted to improve over time due to reductions in emissions resulting from:
- i. reductions in transport exhaust gas pollutants due to improvements in fuel efficiency and the uptake of low emission vehicles;
  - ii. the reduction in the use of fossil fuels prior to the ban on the sale of new petroleum and diesel cars in the UK by 2030;
  - iii. reductions in pollutant emissions from agricultural sources due to improvements in management envisaged in the 2019 Clean Air Strategy (Ref 15); and
  - iv. improved emission standards for NRMM and static generators.
- 12.5.31 As concentrations of air pollutants are projected to decrease with time, the earlier the assessment year the higher the level of projected background pollution. Therefore, the earlier the assumed opening year, the more conservative the assessment result. The earliest year by which the Project could potentially be operational is 2033 and

construction is predicted to begin in 2029. Therefore, 2029 air pollutant data have been used to provide a conservative representation of opening year background concentrations (Ref 8).

- 12.5.32 The arithmetic mean, minimum and maximum of predicted pollutant concentrations for the future baseline Section 5 Study Area for 2029 is shown in **Table 12.6**. There are reductions in both NO<sub>x</sub> and NO<sub>2</sub> levels within the Section 5 Study Area compared to the 2024 forecast as shown in **Table 12.4**. There is a steady reduction in both NO<sub>x</sub> and NO<sub>2</sub> concentrations of about 0.9 – 1.1 µg/m<sup>3</sup>, and a reduction in PM<sub>10</sub> and PM<sub>2.5</sub> of 0.4 µg/m<sup>3</sup>.

Table 12.6 2029 modelled Defra background concentrations within the Section 5 Study Area

Average (Minimum - Maximum) 2029 Annual Mean Concentration (µg/m <sup>3</sup> )			
NO <sub>x</sub>	NO <sub>2</sub>	PM <sub>10</sub>	PM <sub>2.5</sub>
6.3 (5.9 - 8.1)	5.0 (4.7 - 6.4)	13.0 (12.2 - 13.3)	5.6 (5.5 - 5.8)

- 12.5.33 Future baseline background NH<sub>3</sub> concentrations, rates of nutrient nitrogen and acid deposition are currently unknown. For the ES, these will be calculated using data from APIS projected using growth factors taken from best practice guidance.

## 12.6 Design, Control and Additional Mitigation Measures

### Design Mitigation Measures

- 12.6.1 The Project is being designed to avoid sensitive receptors as far as practicable. This is in accordance with the ‘Holford Rules’ (Ref 16) applicable to routing of new overhead lines and the ‘Horlock Rules’ (Ref 17) 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 18) 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.
- 12.6.2 Input from environmental specialists will be an integral part of the ongoing design development process for the proposed works within Section 5, to ensure that potential environmental impacts are avoided or reduced as far as reasonably practicable. This will inform decisions regarding the siting of substation(s) and the routeing of overhead infrastructure as well as the siting of temporary works during construction and associated ancillary works.
- 12.6.3 Further detail on the embedded design mitigation measures applicable to Section 5 will be provided within the ES.

### Control Mitigation Measures

- 12.6.4 A Preliminary Code of Construction (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 Air Quality assessment of Section 5 include :

- i. GG01: The Project will be compliant with all relevant legislation, consents and permits.
- ii. GG03: Suitably experienced Environmental Advisers will be appointed for the duration of the construction phase. In addition, qualified and experienced Environmental Clerks of Works 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 Environmental Clerks of Works will monitor that the works proceed in accordance with relevant environmental DCO requirements and adhere to the required good practice and mitigation measures. The Environmental Clerks of Works will be supported as necessary by appropriate specialists, including ecologists and arboriculturists, soils and land drainage experts.
- iii. 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.
- iv. GG06: A Construction Environmental Management Plan (CEMP), a Landscape and Ecological Management Plan (LEMP), a Materials and Waste Management Plan (MWMP), a Construction Traffic Management Plan (CTMP), Emergency Action Plan, Public Rights of Way Management Plan (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), 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.

- vi. GG10: The name and contact details for the Project will be displayed at the entrance to all compounds. This will include an emergency number.
- vii. 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.
- viii. GG13: Vehicles will be correctly maintained and operated in accordance with manufacturer's recommendations and in a responsible manner. All plant and vehicles will be required to switch off their engines when not in use and when it is safe to do so. Electric, or other low carbon plant and equipment should be used where available and where practicable
- ix. GG14: Materials and equipment will not be moved or handled unnecessarily. When loading and unloading materials from vehicles, including excavated materials, drop heights will be limited.
- x. GG18: Wheel washing facilities will be provided at each main compound, where appropriate. Road sweepers will be deployed on public roads where necessary to prevent excessive dust or mud deposits.
- xi. GG19: Earthworks and stockpiled soil will be managed as per the SMP.
- xii. GG20: Bonfires and the burning of waste material will be prohibited.

12.6.5 The control and management measures included within the Preliminary CoCP specific to Air Quality include:

- i. 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 are nearby, to monitor dust. This should include regular dust soiling checks of surfaces such as street furniture, cars and windowsills within 100 m of the 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 upon request.
  - 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.
  - 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.
- ii. AQ03: During construction, bulk cement and other fine powder materials are to be delivered in enclosed tankers and stored in silos with suitable emission control systems to prevent escape of material and overfilling during delivery. Sand and other aggregates are to be stored in bunding areas and not allowed to dry out, unless this is required for a particular process, in which case ensure that appropriate control measures to reduce dust are in place. For smaller supplies of fine powder materials, bags are to be sealed after use and stored appropriately. Scabbing (roughening of concrete surfaces) will be avoided if possible.
- iii. AQ04: The contractor is to inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
- iv. AQ05: To minimise the impact from trackout, on-site activities will:
- Impose and signpost a maximum speed limit of 15 mph on surfaced and 10 mph on unsurfaced haul roads and work areas (if long haul routes are required these speeds may be increased with suitable additional control measures, subject to the approval of the nominated undertaker and in agreement with the local authority, where appropriate).
  - Use water-assisted dust sweeper(s) on the access and local roads, to remove, as necessary, any material tracked out of the site. This may require the sweeper being continuously in use.
  - Avoid dry sweeping of large areas.
  - Ensure vehicles entering and leaving sites are covered to prevent escape of materials during transport.
  - Inspect on-site haul routes for integrity and instigate necessary repairs to the surface as soon as reasonably practicable.
  - Record all inspections of haul routes and any subsequent action in the site log book.
  - Install hard surfaced haul routes, which are regularly damped down with fixed or mobile sprinkler systems, or mobile water bowsers and regularly cleaned.

- Implement a wheel washing system (with rumble grids to dislodge accumulated dust and mud prior to leaving the site where reasonably practicable).
  - Ensure there is an adequate area of hard surfaced road between the wheel wash facility and the site exit, wherever site size and layout permits.
  - Access gates to be located at least 10 m from receptors where possible.
- v. AQ06: Dust pollution from earthworks activities will be limited through the use of the following measures, as appropriate:
- Topsoil will be stripped as close as reasonably practicable to the period of excavation or other earthworks activities to avoid risks associated with run-off or dust generation.
  - Hessian, mulches, or tackifiers will be used where it is not possible to re-vegetate or cover with topsoil as soon as practicable.
  - Materials will be compacted after deposition, with the exception of topsoil and subsoil on land to be restored for agriculture, forestry, landscaping and wildlife habitats.
  - Cover will only be removed in small areas during work and not all at once.
  - Soil spreading, seeding, planting or sealing of completed earthworks will be undertaken as soon as reasonably practicable following completion of the earthworks.
- vi. AQ07: Operating vehicle/machinery will follow the below:
- Construction vehicles will be required to meet Euro VI emissions standards which reduce NO<sub>x</sub> and PM<sub>10</sub> emissions.
  - All NRMM with an engine power rating of 37 kW to 560 kW will be required to meet Euro Stage IV standards as a minimum.
  - Avoid the use of diesel or petrol-powered generators and use mains electricity or battery powered equipment where practicable to limit emissions from plant and NRMM.
  - Low and zero emission vehicles will be used where possible for site use.
  - Produce a Construction Logistics Plan to manage the sustainability of goods and materials.
  - Implement a Construction Workforce Travel plan to support and encourage sustainable travel.
  - Ensure all vehicles switch off engines when stationary - no idling vehicles.
  - All vehicles, plant and NRMM will be regularly inspected, serviced and maintained.

## Additional Mitigation Measures

- 12.6.6 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.



- 12.6.7 Additional mitigation measures are not anticipated to be required in relation to Air Quality effects. However, this will remain under review during the completion of further assessment and development of the ES.
- 12.6.8 It is however noted that additional environmental mitigation which has been proposed to reduce effects upon visual amenity and ecology and biodiversity may also reduce impacts upon Air Quality. This includes screening vegetation which, while primarily included to limit visual intrusion (for landscaping purposes), may further reduce potential Air Quality in impacts by filtering dust and air pollutants emitted by construction site activities.

## 12.7 Preliminary Assessment of Effects

- 12.7.1 The following section presents the findings of the preliminary assessment of effects upon the relevant Air Quality receptors identified within the Section 5 Study Area, as a result of construction, maintenance and/or operational activities.
- 12.7.2 The preliminary assessment of effects reported below takes into account the Design and Control mitigation measures previously described.
- 12.7.3 For a summary of the likely significant effects please refer to **PEI Report Volume 2 Part B Section 5 Chapter 13 Summary**. A supplementary summary of all non-significant effects is also included within this Section in **Table 12.12**, based upon the assessment scope detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 12.7.4 It is noted that this is an ongoing assessment and is subject to change due to the ongoing design development of the Project. This is particularly relevant to the further assessment of the likely air quality effects of changes in traffic flow due to the Project. A full assessment will be included within the ES submitted with the DCO application.

### Likely Significant Effects

#### Construction

##### Construction Dust

- 12.7.5 The preliminary assessment presented indicates that no significant effect are likely due to construction dust and PM<sub>10</sub>. Further rationale is provided in the following sections in relation to non-significant effects.

##### Construction Traffic Emissions

- 12.7.6 The methodology followed for predicting construction traffic flows is given in **PEI Report Volume 2 Part B Section 5 Chapter 9 Traffic and Movement**. Construction traffic flows (in terms of LGVs and HGVs) have been provided for the current year of 2024 and 2031, which is anticipated to be the busiest period for vehicle movements.
- 12.7.7 Initial screening of the projected construction traffic flows against the EPUK/IAQM change criteria (for human sensitive receptors) and the IAQM criteria (for ecological sensitive receptors) has been undertaken. The road links where the criteria are exceeded in the SHDC local authority area are shown in **PEI Report Volume 2 Part**

**B Section 5 Figure 12.2 Preliminary Affected Road Network and Local Authority Monitoring Locations** and presented in **Table 12.7**.

- 12.7.8 Based on the initial screening, changes in traffic flows on 11 road links which form parts of the A16, A151, Marsh Road and Stone Gate within Spalding, exceed the EPUK/IAQM screening criteria for human sensitive receptors. Given these links are located outside an AQMA, the relevant criteria are:
- i. a change in LDV flows of more than 500 AADT; and/or
  - ii. a change in HDV flows of more than 100 AADT.
- 12.7.9 The initial screening has also identified road links which exceed the IAQM screening criteria for ecological sensitive receptors. The relevant criteria are:
- i. a change in total traffic flows greater than or equal to equal to 1000 AADT; and/or
  - ii. a change in HDV flows greater than or equal to 200 AADT.

Table 12.7 Road Links exceeding the relevant assessment criteria – construction traffic

Road Link	Road Name	2024 Base		2031 Future Base		2031 Construction		
		AADT (total vehicles/day)	HGV (vehicles/day)	AADT (total vehicles/day)	HGV (vehicles/day)	Change in AADT Flows (total vehicles/day)	Change in LGV Flows (vehicles/day)	Change in HGV Flows (vehicles/day)
CR11-3	A16	20116	3088	21679	3327	369	139	229
CR12-2	A16	17435	1938	18790	2088	308	72	235
CR11-4	A16	23808	3164	25658	3410	367	137	229
CR11-1	A16	18830	3207	20293	3456	341	95	245
CR11-2	A16	16661	1765	17956	1902	353	123	229
CR12-1	A16	16125	2380	17378	2565	338	102	235
LK65	Marsh Road, Spalding	145	20	156	22	502	348	155
LK66	Stone Gate, Spalding	0	0	0	0	239	82	157
LK87	A151	0	0	0	0	164	7	157
LK79	A151	16435	1620	17712	1746	312	7	305
LK86	A151	12544	1593	13519	1717	298	7	291

Note:

All traffic data presented in the table has been rounded to the nearest whole number.

- 12.7.1 Human and ecological sensitive receptors adjacent to road links where the projected changes in traffic flows due to construction of the Project do not exceed the EPUK/IAQM and IAMQ criteria have been screened out of any further assessment and therefore significant effects at these locations are considered unlikely.
- 12.7.2 Finalised traffic projections produced in support of the ES will, however, be rescreened to confirm that changes in traffic flows due to construction of the Project exceed the relevant criteria. Where this is the case, a detailed assessment involving dispersion modelling will be undertaken and reported in the ES, based upon the methodology summarised in section 12.5 and detailed within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**.
- 12.7.3 It is noted that vehicle movements during construction of the Project will vary throughout the construction programme, with relatively short peaks in LGV and HGV movements, associated with workforce travel and the import/export of construction materials respectively. It is assumed that any peak in HGV movements will be short in duration.
- 12.7.4 Notwithstanding this, at receptors within 200 m of those road links identified in **Table 12.7**, significant effects due to changes in air quality cannot be ruled out at this stage, in the absence of dispersion modelling results.

### Operation

- 12.7.5 It is currently predicted that the operational and maintenance traffic flows will fall below the EPUK/IAQM change criteria (for human sensitive receptors) and the IAQM criteria (for ecological sensitive receptors). However, screening against both the EPUK/IAQM and IAQM screening criteria will be undertaken at the ES Stage.

## Likely Non-significant Effects

### Construction Dust Assessment

- 12.7.6 **PEI Report Volume 2 Part B Section 5 Figure 12.1 Construction Dust Study Area** shows the construction dust Study Area. The construction of the 400 kV OHL would generally follow the sequence outlined in **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project**.
- 12.7.7 Construction activities that have the potential to generate and/or re-suspend dust and PM<sub>10</sub> include:
- i. site surveys and preparation;
  - ii. enabling works, including localised utility works;
  - iii. establishment of temporary access/egress to the Site and haul routes;
  - iv. establishment of construction compounds;
  - v. earthworks, including the groundworks (soil stripping and excavation for substation and pylon foundations);
  - vi. materials handling, storage, stockpiling and disposal;
  - vii. movement of vehicles and construction traffic within the Refined Siting Zone boundary;

- viii. exhaust emissions from site plant and NRMM, especially when used at the extremes of their capacity and during mechanical breakdown;
- ix. construction of foundations and substation aprons;
- x. construction of buildings and areas of hardstanding alongside fabrication processes;
- xi. pylon assembly;
- xii. establishment of scaffolding and crossing protection;
- xiii. conductor stringing;
- xiv. demobilisation of construction compounds and temporary accesses; and
- xv. site reinstatement.

12.7.8 The majority of the dust releases during construction are likely to occur in the 'working week', during which construction activities are undertaken. However, for some potential release sources (e.g. exposed soil or stockpiles), in the absence of dust control mitigation measures, dust generation has the potential to occur 24 hours per day, 7 days per week, until such works are complete and areas are reinstated.

12.7.9 The construction dust assessment methodology adopts a worst-case approach and treats all receptors within the Section 5 Study Area consistently. There will, however, be considerable variation in the magnitude of dust emissions throughout the construction phase dependant on specific construction activities being undertaken at any one time. This includes, for example, variation in the number of vehicles throughout the construction programme, which will affect the trackout of dust emissions.

12.7.10 Therefore, the risk of impacts to local amenity will vary throughout construction and be greater during certain periods (e.g. during the peak of earthwork activities). Several receptors within Section 5 Study Area will also be influenced by construction activities for shorter periods than others. For example, a sensitive receptor location in proximity to a pylon location is likely to experience impacts for a shorter period than a receptor in proximity to a construction compound site. This is due to the greater scale and duration of construction activities associated with a construction compound, relative to the activities required for the erection of pylons. This assessment will be refined further as more detail is available in the ES submitted with the DCO application.

### Assessment of Potential Dust Emission Magnitude

12.7.11 The IAQM assessment methodology has been used to determine the potential dust emission magnitude for the following four different dust and PM<sub>10</sub> sources: demolition; earthworks; construction; and trackout. The findings of the assessment are presented below.

#### Demolition

12.7.12 On a precautionary basis, notwithstanding the ongoing design development process for proposed works within Section 5, there is assumed to be a requirement to carry out works to reconfigure the existing 400 kV OHLs, involving both temporary OHL diversions and permanent modifications to the existing OHL alignments. As part of this work, some of the existing 400 kV pylons will be dismantled and removed where

they are no longer required following the realignment of the OHLs, or where the existing pylons need to be removed to provide space for the new OHL alignments.

- 12.7.13 Based upon precautionary assumptions, the total volume of assumed works is more than 75,000 m<sup>3</sup> and is therefore defined as large.

#### Earthworks

- 12.7.14 The main earthworks that will be undertaken are localised preparation for substation and pylon foundation construction and landscaping. The main soil type within the Section 5 Study Area is Wisbech Association which is seasonally waterlogged affected by a shallow fluctuating ground-water table. More information on each soil type is given within **PEI Volume 2 Section 5 Chapter 8 Agriculture and Soils**.

- 12.7.15 The total area of the Site falls within the IAQM range for large sites (over 110,000 m<sup>2</sup>). Therefore, the potential dust emission magnitude is judged to be large for earthwork activities given the scale of the site and the soil types present.

#### Construction

- 12.7.16 The total volume of buildings<sup>6</sup> (substations, pylons and construction compounds) to be constructed on the Site will be above 75,000 m<sup>3</sup> with potentially dusty construction materials being used. Therefore, the potential dust emission magnitude is judged to be large for construction activities.

#### Trackout

- 12.7.17 There are likely to be between over 50 HDV outward movements in any one day, travelling over potentially dusty surface material. It is considered that the potential dust emission magnitude is large for trackout.

#### Dust Emission Magnitude Summary

- 12.7.18 **Table 12.8** provides a summary of the potential dust emission magnitude determined for each construction activity considered.

**Table 12.8** Potential dust emission magnitude

Activity	Dust Emission Magnitude
Demolition	Large
Earthworks	Large
Construction	Large
Trackout	Large

#### Assessment of Sensitivity of the Study Area

- 12.7.19 The prevailing wind direction is from the south. Therefore, receptors located to the north of the Refined Siting Zone boundary (specifically the residential properties off

<sup>6</sup> For the purposes of the assessment, pylons have been defined as buildings. The Building Act 1984 defines the word “building” as “any permanent or temporary building, and, unless the context otherwise requires, it includes any other structure or erection of whatever kind or nature (whether permanent or temporary)”.

March Road on the edge of Refined Siting Zone boundary) are more likely to be affected by dust and PM<sub>10</sub> emitted and re-suspended during the construction phase.

12.7.20 Surfleet Bank Local Wildlife Site is situated less than 10 m northwest of the Refined Siting Zone boundary. Both Surfleet Seas End Saltmarsh and Vernatt’s Drain are within 200m of the Refined Siting Zone boundary. As per the IAQM guidance (Ref 4), a Local Wildlife Site is deemed to be a low sensitivity receptor.

12.7.21 Under low wind speed conditions, it is likely that the majority of dust would be deposited in the area immediately surrounding the source. This area mainly comprises arable land, the receptor counts are outlined in **Table 12.9** There are also sensitive receptors along the public highways which could be used as construction routes within 250 m of the Site, including residential receptors on Marsh Road and Carrington Road. Background PM<sub>10</sub> levels are predicted to be well below the annual mean objective (see **Table 12.4**).

Table 12.9 Count of human sensitive receptors within defined distances

Section Number	Distance from Refined Siting Zone Boundary				
	0-20 m	0-50 m	0-100 m	0-200 m	0-250 m
5	10	28	40	84	139

12.7.22 Taking the above number and sensitivity of receptors into account and following the IAQM assessment methodology, the sensitivity of the area to changes in dust and PM<sub>10</sub> has been derived for each of the construction activities considered. The results are shown in **Table 12.10**.

Table 12.10 Sensitivity of the Section 5 Study Area

Potential Impact	Sensitivity of the Surrounding Area			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High
Human Health	Low	Low	Low	Low
Ecological	Low	Low	Low	Low

#### Assessment of Dust Risk to Define Site-Specific Mitigation

12.7.23 The predicted dust emission magnitude has been combined with the defined sensitivity of the area to determine the risk of impacts during the construction phase, prior to mitigation. **Table 12.11** below provides a summary of the risk of dust impacts for the Project. The risk category identified for each construction activity has been used to determine the level of mitigation required.

Table 12.11 Summary dust risk table

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Dust Soiling	High	High	High	High

Potential Impact	Risk			
	Demolition	Earthworks	Construction	Trackout
Human Health	Medium	Low	Low	Low
Ecological	Medium	Low	Low	Low

12.7.24 Control measures relevant to dust impacts during construction are set out within the Preliminary CoCP and summarised in section 12.6. Based upon the identified risk, an appropriate suite of dust management measures will be specified within the DMP to be included in the CEMP, which will be adhered to during construction (Preliminary CoCP measure AQ1). Based upon the application of the DMP and the further management measures included within Preliminary CoCP, it is not considered likely that there would be significant effects associated with dust generated during construction.

### Construction Traffic Emissions

12.7.25 Where projected changes in vehicle movements due to construction are below the EPUK/IAQM thresholds and IAQM thresholds, changes in air quality at relevant receptor locations are unlikely to be significant. However, the change in HGV vehicle trips will be rescreened and assessed as per the EPUK/IAQM guidance (Ref 6) and IAQM guidance (Ref 7) and the outcomes reported within the ES.

### Operation and Maintenance

12.7.26 It is considered unlikely, based upon professional experience of similar projects, that the operation/maintenance vehicle movements associated with the elements of the Project located in Section 5 will exceed EPUK/IAQM screening criteria described above (Ref 6). However, once full operational traffic data has been made available, a detailed assessment of any road links where predicted operational traffic flows exceed the criteria will be completed and reported within the ES.

### Summary

12.7.27 For completeness, **Table 12.12** summarises the findings of the preliminary assessment with respect to those impacts that are not predicted to result in significant Air Quality effects.



Table 12.12 Preliminary summary of non-significant Air Quality effects – Section 5

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
<b>Construction</b>					
Human Health Receptors sensitive to construction dust impacts	Without mitigation, there may be adverse impacts to human health owing to construction dust impacts.	There are 10 receptors within 20 m of the Refined Siting Zone boundary, therefore according to the IAQM guidance, the area sensitivity is classified as high.	Negligible	Not significant	With the appropriate mitigation in place as described in the chapter and as will be secured in the Preliminary CoCP, construction dust impacts are not considered significant.
Receptors sensitive to amenity loss from construction dust	Without mitigation, there may be adverse impacts to receptors sensitive to amenity loss within 250m of the Refined Siting Zone boundary.	There are over 10 receptors within 20 m of the Refined Siting Zone boundary, therefore according to the IAQM guidance, the area sensitivity is classified as high.	Negligible	Not significant	With the appropriate mitigation in place as described in the chapter and as will be secured in the Preliminary CoCP, construction dust impacts are not considered significant.
Ecological receptors sensitive to construction dust impacts	Without mitigation, there may be adverse impacts to ecological sites through dust deposition.	There are Local Wildlife Sites within 200 m of the Refined Siting Zone boundary, therefore, according to the IAQM guidance, the receptor sensitivity is low.	Negligible	Not significant	With the appropriate mitigation in place as described in the chapter and as will be secured in the Preliminary CoCP, construction dust impacts are not considered significant.
<b>Operation and Maintenance</b>					
Human Health Receptors sensitive to	Changes in pollutant concentrations due to operation/maintenanc	No road links have been identified which exceed the relevant criteria.	Negligible	Not significant	Projected changes in traffic flow during operation and maintenance of the Project are low and are not

Receptor	Impact	Sensitivity/ Importance/ Value of Receptor	Magnitude of Change	Significance	Rationale
<p>changes in air quality</p> <p>Ecological Receptors sensitive to changes in air quality</p>	<p>e vehicle emissions associated with the Project.</p>				<p>predicted to exceed the relevant assessment criteria. Therefore, changes in pollutants concentrations due to operational/maintenance traffic are not predicted to be significant.</p>

## **12.8 Monitoring**

- 12.8.1 As part of the CoCP, a CEMP will be prepared which will include dust management measures as outlined above. Control Mitigation Measure AQ01 includes for daily on-site and off-site visual inspections which would be undertaken by the Contractor(s) to monitor dust levels. These inspection findings would be recorded in the site log.
- 12.8.2 The proposed Control Mitigation Measures are anticipated to minimise the impacts such as that no significant effect would be expected. Consequently, no Air Quality monitoring beyond on-site and off-site visual inspections would be required during the construction and operational phases of the Project.

# References

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- Ref 10 Defra (2025). AQMAs Interactive Map [online]. Available at: <https://uk-air.defra.gov.uk/aqma/maps/> [Accessed 11 March 2025].
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- Ref 13 UK Pollutant Release and Transfer Register data sets (2024). Public Register of Industrial Pollution Sources. Available at: <https://prtr.defra.gov.uk/map-search> [Accessed 27 November 2024].
- Ref 14 South Holland District Council (2024). Environmental Permitting [online]. Available at: <https://www.sholland.gov.uk/article/5654/Environmental-Permitting> [Accessed 02 January 2025].
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# 13. Summary

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# 13. Summary for Section 5 Refined Weston Marsh Substation Siting Zone

## 13.1 Introduction

- 13.1.1 This chapter summarises the findings of the preliminary assessment of likely significant environmental effects arising from the construction, operation and maintenance of the Project within the Refined Weston Marsh Substation Siting Zone (hereafter referred to as the Refined Siting Zone) (Section 5). The full preliminary assessments, including the rationale as to why an effect is considered to be significant or not significant can be found in **PEI Report Volume 2 Part B Section 5 Chapter 2 to 12**.
- 13.1.2 The significant effects summarised in **Table 13.2** and **Table 13.3** take into account the design and embedded mitigation measures and control mitigation measures described within Chapter 2-12. As outlined in **PEI Report Volume 2 Part B Section 5 Chapter 1 Overview of the Section and Description of the Project** the design of the Project within Section 5 is still being developed. As such no additional mitigation measures have been identified for this preliminary assessment and therefore the likely significant effects identified in **Table 13.2** and **Table 13.3** have not considered any. This will however be reviewed and updated for the Environmental Statement (ES) following design development of Section 5.
- 13.1.3 Baseline data is also still being collected, surveys are still being undertaken, and the design of the Project will be refined prior to the Development Consent Order (DCO) application being submitted. As such, a confidence rating has been introduced in the summary tables below which provides a rating of high, moderate or low confidence in the prediction of the significance of effects. Definitions of the confidence ratings are provided in **Table 13.1**
- 13.1.4 As the design evolves mitigation measures and environmental assessments will be further developed and reported within the Environmental Statement (ES) submitted with the DCO application.

Table 13.1 Confidence level definitions

Confidence Level	Definition
High Confidence	<p>A high level of confidence in the prediction of significant effects can be justified through:</p> <ul style="list-style-type: none"><li>• The consideration of, and routeing and/or siting of the Project away from, designated features and high sensitivity receptors;</li><li>• Complete baseline data to inform the prediction;</li><li>• Mitigation measures are fully defined and/or the application of mitigation measures has proven to be effective in similar projects; and</li></ul>



Confidence Level	Definition
Moderate Confidence	<ul style="list-style-type: none"> <li>• A thorough understanding of Project activities.</li> </ul> <p>A moderate level of confidence in the prediction of significance of effects can be justified through:</p> <ul style="list-style-type: none"> <li>• Particular surveys or assessments are incomplete at this stage, but it is possible to extrapolate results;</li> <li>• Mitigation measures will continue to be developed up to the submission of the application for consent; and</li> <li>• A general understanding of the Project activities being undertaken, and the associated impacts based on other Projects, while more detailed information will be provided later.</li> </ul>
Low Confidence	<p>A low level of confidence in the prediction of significance of effects can be justified through:</p> <ul style="list-style-type: none"> <li>• Only limited baseline data is available at this stage;</li> <li>• Input assessments (e.g. modelling outputs) are unavailable or limited, to the extent it isn't possible to confidently identify the effect and its significance.</li> <li>• Exact project activities are unknown;</li> <li>• Mitigation measures remain in the early stages of development; and</li> <li>• Where this is the case, a precautionary, worst-case approach is taken.</li> </ul>

Table 13.2 Summary of significant effects during the construction phase

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
<b>Landscape</b>				
<p>The East Midlands Regional Landscape Character Types (RLCT) of RLCT 2A: Settled Fens and Marshes would be directly impacted by the construction of the proposed new Weston Marsh Substation A and/or the new Weston Marsh Substation B and the construction of construction compounds and haul roads causing changes in the character and perception of the landscape.</p>	<p>The new substation(s) and associated works will be designed to be located close to areas of existing vegetation to screen views of the substation(s) and the location of access tracks, bellmouths and overhead line alignment refined to minimise loss of mature vegetation, where practicable.</p>	<p>The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p>	Adverse effect	High
<p>The East Midlands Regional Landscape Character Types (RLCT) of RLCT 2A: Settled Fens and Marshes would be indirectly impacted by the construction of the new 400 kV overhead line causing changes in the character and perception of the landscape.</p>	<p>Construction related impacts would be managed through the measures outlined within the Preliminary Code of Construction Practice (CoCP).</p>			
<b>Visual</b>				
<p>The two communities of Moultons Parish and Weston Parish would both be directly impacted by the</p>	<p>The new substation(s) and associated works will be designed to be located close</p>	<p>The assessment does not consider additional measures</p>	Adverse effect	High

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
<p>construction of the new Weston Marsh Substation A and/or the new Weston Marsh Substation B with the associated construction compounds, haul road, and construction of the 400 kV overhead line causing visual changes to the landscape, resulting in changes to views from receptor locations. Views out of the parish to the north and south would also be affected by construction activities associated with the construction of overhead lines outside of the parishes.</p>	<p>to areas of existing vegetation to screen views of the substation(s) and the location of access tracks, bellmouths and overhead line alignment refined to minimise loss of mature vegetation, where practicable.</p> <p>Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.</p>	<p>as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p>		

## Ecology and Biodiversity

### Designated Sites

<p>Birds species which are qualifying features of the following European Designated Sites may be impacted by construction activities within functionally linked land, potentially resulting in temporary displacement and/or habitat degradation:</p> <ul style="list-style-type: none"> <li>The Wash Special Protection Area (SPA) and Ramsar Site; and</li> <li>Nene Washes SPA and Ramsar Site</li> </ul>	<p>The new substation(s) and associated works will be designed to minimise the extent of land take required for construction as far as reasonably practicable. The substation(s) and overhead line will be sited carefully to minimise the impact on habitats and protected species where practicable.</p>	<p>The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p> <p>These measures will be informed by ongoing survey and</p>	<p>Significant adverse effects cannot be excluded at this stage.</p>	<p>Low – further assessment is required once surveys are completed and data assessed. The potential for likely significant effect (LSE) upon these sites will be assessed within the Report to Inform the Habitat Regulations Assessment, informed by discussions</p>
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Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
<p>Otters and habitats such as seedbanks, mudflats and coastal lagoons which are qualifying features of The Wash and North Norfolk Coast SAC may be impacted by construction activities within functionally linked land, resulting in temporary displacement and/or habitat degradation.</p>	<p>Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.</p>	<p>assessment and are likely to include the creation of replacement habitats where required to avoid significant effects.</p>	<p>Significant adverse effects cannot be excluded at this stage.</p>	<p>with Natural England other statutory bodies.</p>
<p>The bird species which are functionally linked to The Wash Site of Special Scientific Interest (SSSI) may be impacted by construction activities within functionally linked land, resulting in temporary displacement and/or habitat degradation.</p>	<p>The new substation(s) and associated works will be designed to minimise the extent of land take required for construction as far as reasonably practicable. The substation(s) and overhead line will be sited carefully to minimise the impact on habitats and protected species where practicable. Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.</p>		<p>Significant adverse effects cannot be excluded at this stage.</p>	<p>Low - potential impacts upon the bird assemblage will be assessed once all baseline surveys are complete.</p>
<p>15 local wildlife sites (LWSs) including Surfleet Bank LWS, and Surfleet Seas End Saltmarsh LWS and Vernatts Drain LWS may be impacted by construction activities causing habitat loss and/or</p>	<p>The new substation(s) and associated works will be designed to minimise the extent of land take required for construction as far as reasonably practicable. The</p>		<p>Significant adverse effects cannot be excluded at this stage.</p>	<p>Low - Survey works are ongoing and will inform further assessment of impacts.</p>

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
degradation and adverse effects on local fauna.	substation(s) and overhead line will be sited carefully to minimise the impact on habitats and protected species where practicable. Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.			

### Habitats

Terrestrial habitats may be directly impacted directly by construction of the new substation(s), new pylons, stringing areas and haul road causing loss of habitats effecting local flora and fauna. Terrestrial habitats such as grazing marsh which have hydrology links may also be indirectly impacted by the release or mobilisation of contaminants as a result of construction.	The new substation(s) and associated works will be designed to minimise the extent of land take required for construction as far as reasonably practicable. The substation(s) and overhead line will be sited carefully to minimise the impact on habitats and protected species where practicable.	The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.	Significant adverse effects cannot be excluded at this stage.	Low - survey works are ongoing and will inform further assessment of impacts and effects and the design of any required mitigation measures.
Aquatic habitats may be directly and indirectly impacted by construction activities associated with the construction of the substation(s), overhead line and access watercourse crossings and diversions, potentially resulting in	Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.	These measures will be informed by ongoing survey and assessment and are likely to include the creation of replacement habitats where required to avoid significant effects.	Significant adverse effects cannot be excluded at this stage.	

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
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temporary loss or damage to watercourses and ditches.

### Protected and Notable Species

The following species may be impacted by construction activities resulting in: loss, damage or fragmentation of suitable habitats; disturbance due to noise and vibration, lighting and/or increased human presence; and/or death/injury:

- Terrestrial Invertebrates;
- Great Crested Newts;
- Reptiles;
- Wintering and breeding birds;
- Badgers;
- Bats;
- Otters;
- Fish;
- Aquatic macroinvertebrates;
- Aquatic macrophytes; and
- Water voles.

The new substation(s) and associated works will be designed to minimise the extent of land take required for construction as far as reasonably practicable. The substation(s) and overhead line will be sited carefully to minimise the impact on habitats and protected species where practicable. Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.

The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.

These measures will be informed by ongoing survey and assessment and are likely to include the creation of replacement habitats where required to avoid significant effects.

Significant adverse effects cannot be excluded at this stage.

Low - survey works are ongoing and will inform further assessment of impacts and effects and the design of any required mitigation measures.

### Historic Environment

### Designated Assets

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
<p>The following grade II listed buildings would be impacted temporarily by construction activities associated with the new substation(s), gantries, new overhead line and new pylons, resulting in changes to their setting:</p> <ul style="list-style-type: none"> <li>• Wraggmarsh House Farmhouse (NHLE 1147603);</li> <li>• Pigeoncote (NHLE 1064477); and</li> <li>• The Chapel Farmhouse (NHLE 1147513) and associated gate piers (NHLE 1064472).</li> </ul>	<p>The new substation(s) and associated works will be designed to be located close to areas of existing vegetation to screen views of the substation(s) and the location of access tracks, bellmouths and overhead line alignment refined to minimise loss of mature vegetation, where practicable.</p>	<p>The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p>	Adverse effect	High
<p>The following grade II listed buildings would be impacted permanently due to the permanency of the infrastructure in the landscape which would noticeably alter their wider setting:</p> <ul style="list-style-type: none"> <li>• Wraggmarsh House Farmhouse (NHLE 1147603);</li> <li>• Pigeoncote (NHLE 1064477); and</li> <li>• The Chapel Farmhouse (NHLE 1147513) and associated gate piers (NHLE 1064472).</li> </ul>	<p>Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.</p>		Adverse effect	High
<p>Wykeham Chapel moated monastic grange (NHLE 1019096) would be impacted temporarily by construction activities associated with the new</p>	<p>The new substation(s) and associated works will be designed to be located close to areas of existing</p>	<p>The assessment does not consider additional measures as they are yet to be</p>	Adverse effect	High

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
substation(s), gantries, new overhead line and new pylons, resulting in changes to the setting of this scheduled monument.	vegetation to screen views of the substation(s) and the location of access tracks, bellmouths and overhead line alignment refined to minimise loss of mature vegetation, where practicable.	developed due to the preliminary nature of the design, for Section 5.	Adverse effect	High
Wykeham Chapel moated monastic grange (NHLE 1019096) would be impacted permanently due to the permanency of the infrastructure in the landscape which would noticeably alter the wider setting of the setting of this scheduled monument.	Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.			
Wykeham Chapel of St Nicholas (NHLE 1064471) would be impacted temporarily by construction activities associated with the new substation(s), gantries, new overhead line and new pylons, resulting in changes to the setting of this Grade I listed building.	The new substation(s) and associated works will be designed to be located close to areas of existing vegetation to screen views of the substation(s) and the location of access tracks, bellmouths and overhead line alignment refined to minimise loss of mature vegetation, where practicable.	The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.	Adverse effect	High
Wykeham Chapel of St Nicholas (NHLE 1064471) would be impacted permanently due to the permanency of the infrastructure in the landscape which would noticeably alter the wider setting of the setting of this Grade I listed building.	Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.		Adverse effect	High



Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
<b>Non-designated Assets</b>				
<p>The following historic farmsteads would be impacted temporarily by construction activities associated with the new substation(s), gantries, new overhead line and new pylons, resulting in changes to the setting of the assets:</p> <ul style="list-style-type: none"> <li>• Crowtree Farm, Weston (MLI122916);</li> <li>• Bottom Yard, Weston (MLI122915);</li> <li>• White House Farm, Weston (MLI122917)</li> <li>• Top Yard, Weston (MLI12291); and</li> <li>• Shepherds Farm, Weston (MLI122924).</li> </ul>	<p>The new substation(s) and associated works will be designed to be located close to areas of existing vegetation to screen views of the substation(s) and the location of access tracks, bellmouths and overhead line alignment refined to minimise loss of mature vegetation, where practicable.</p> <p>Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.</p>	<p>The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p>	Adverse effect	High
<p>The following historic farmsteads would be impacted permanently due to the permanency of the infrastructure in the landscape which would noticeably alter the wider setting of the setting of these non-designated assets:</p> <ul style="list-style-type: none"> <li>• Crowtree Farm, Weston (MLI122916);</li> </ul>			Adverse effect	High

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
<ul style="list-style-type: none"> <li>• Bottom Yard, Weston (MLI122915);</li> <li>• White House Farm, Weston (MLI122917);</li> <li>• Top Yard, Weston (MLI12291); and</li> <li>• Shepherds Farm, Weston (MLI122924).</li> </ul>				
<p>Welland House Farm (Welland House), Weston (MLI122918) would be impacted temporarily by construction activities associated with the new substation(s), gantries, new overhead line and new pylons, resulting in changes to the setting of this asset.</p>	<p>The new substation(s) and associated works will be designed to be located close to areas of existing vegetation to screen views of the substation(s) and the location of access tracks, bellmouths and overhead line alignment refined to minimise loss of mature vegetation, where practicable.</p>	<p>The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p>	<p>Adverse effect</p>	<p>High</p>
<p>Welland House Farm (Welland House), Weston (MLI122918) would be impacted permanently due to the permanency of the infrastructure in the landscape which would noticeably alter the wider setting of the setting of this non-designated asset.</p>	<p>Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.</p>		<p>Adverse effect</p>	<p>High</p>
<p><b>Water Environment and Flood Risk</b></p>				
<p>Third party flood risk receptors may be impacted by the presence of temporary works within defended</p>	<p>Impacts upon floodplain storage and flow conveyance during</p>	<p>The assessment does not consider additional measures</p>	<p>Moderate to Major adverse effect</p>	<p>Low - several factors require further assessment to inform the final Flood</p>

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
floodplain, including construction compounds, haul roads, stockpiles and watercourse crossings, resulting in the temporary loss of floodplain storage and/or change in floodplain flow conveyance (under conditions of flood defence overtopping or breach)	construction would be managed through the measures outlined within the Preliminary CoCP.	as they are yet to be developed due to the preliminary nature of the design, for Section 5.  Any additional mitigation measures may include provision of compensatory storage, subject to ongoing discussions with the Environment Agency.		Risk Assessment, including review of existing flood models, informed by engagement with the Environment Agency.

## Geology and Hydrogeology

No likely significant effects are predicted as a result of the construction phase of the Project, based upon the preliminary assessment.

## Agriculture and Soils

### Agricultural Land Classification

It is assumed that all land within Section 5 may be temporarily impacted by construction activities, including establishment of haul roads and temporary compounds, resulting in temporary loss of agricultural land.	The Project has been designed to minimise the extent of land take required to construct, maintain and operate the proposed assets and position infrastructure (such as pylons and haul roads) as close as is practicable to field boundaries to minimise	The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.	Adverse effect	High
Agricultural land (assumed to be BMV land) would be permanently impacted by the construction of operational infrastructure including			Adverse effect	High

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
the proposed new Weston Marsh Substation A and/or the new Weston Marsh Substation B and associated accesses and pylon foundations, resulting in the permanent loss of agricultural land.	impacts to agricultural operations. Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.			
<b>Soil Function</b>				
Soils within Section 5 would be temporarily impacted by construction activities including topsoil/subsoil stripping and storage, resulting in temporary effects on soil quality and ecosystem services.	The Project has been designed to minimise the extent of land take required to construct, maintain and operate the proposed assets and position infrastructure (such as pylons and haul roads) as close as is practicable to field boundaries to minimise impacts to agricultural operations. Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.	The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.	Adverse effect	High
Soils within Section 5 would be permanently impacted by the construction of operational infrastructure, including the proposed new Weston Marsh Substation A and/or the new Weston Marsh Substation B and associated accesses and pylon foundations, resulting in loss of soil quality and ecosystem services.			Adverse effect	High
<b>Traffic and Movement</b>				
<b>Users of Highways Links</b>				
Drivers (all vehicles including HGVs and Emergency Services) may be	Identified construction traffic routes are based upon	The assessment does not consider	Significant adverse	Low - construction traffic routes, flows and numbers

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
<p>impacted where projected increases in traffic flows exceed the relevant Institute of Environmental Management and Assessment thresholds. Where this is the case, change in traffic flow may result in severance, changes in journey time, driver delay and highway safety effects.</p>	<p>classified roads as far as practicable. Haul roads would be used to reduce construction traffic movements on local roads. Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.</p>	<p>additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p>	<p>effects cannot be excluded at this stage</p>	<p>are not yet known and have been estimated for the purposes of the PEI Report. Detailed assessment of severance, delay, highway safety and fear and intimidation, has yet been undertaken to determine the magnitude of impacts upon identified road links.</p>
<p>Bus passengers may be impacted on those routes where projected increases in traffic flows exceed the relevant Institute of Environmental Management and Assessment thresholds, potentially resulting in delay due to congestion.</p>			<p>Significant adverse effects cannot be excluded at this stage</p>	
<p>Pedestrians and cyclists may be impacted on those routes where projected increases in traffic flows exceed the relevant Institute of Environmental Management and Assessment thresholds, potentially resulting in severance, delay, increased journey time, decline in amenity, additional fear and intimidation and safety effects.</p>			<p>Significant adverse effects cannot be excluded at this stage</p>	

### Noise and Vibration

No likely significant effects are predicted as a result of the construction phase of the Project, based upon the preliminary assessment.

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
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### Socio-economics, recreation and tourism

Solar farms could be directly impacted through the potential temporary and/or permanent loss of land during construction.	<p>The Project will be designed to minimise the extent of land take required to construct, maintain and operate the proposed assets and position infrastructure. The positioning of pylons and access routes will seek to avoid or reduce direct and indirect impacts receptors through minimising land permanent and temporary land take.</p> <p>Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.</p>	The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.	Adverse effect	Low- the potential impacts upon solar farms will be assessed once the siting of the substation(s) is known. This will be reported within the ES
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### Air Quality

Human sensitive receptors (including residential properties, schools, care homes and hospitals) which are within 200 m of road links projected to experience increases in traffic flow which are above the Environmental Protection UK/Institute of Air Quality Management and Assessment thresholds, could be exposed to	The Project will be designed to maximise the separation between sensitive receptors and the proposed temporary and permanent access roads as far as reasonably practicable.	The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.	Significant adverse effects cannot be excluded at this stage	Low - Dispersion modelling will be undertaken for the ES and will inform further assessment of impacts and effects and the design of any required mitigation measures.
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Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/ moderate/ low)
increased pollutant concentrations during the construction phase.	Construction related impacts would be managed through the measures outlined within the Preliminary CoCP.			
Ecological sensitive receptors which are within 200m of road links projected to experience increases in traffic flow which are above the Environmental Protection UK/Institute of Air Quality Management and Assessment thresholds, could be exposed to increased pollutant concentrations during the construction phase.			Significant adverse effects cannot be excluded at this stage	Low - Dispersion modelling will be undertaken for the ES and will inform further assessment of impacts and effects and the design of any required mitigation measures.

Table 13.3 Summary of significant effects during the operation and maintenance phase

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
<b>Landscape</b>				
The RLCT of RLCT 2A: Settled Fens and Marshes would be directly impacted by the presence of the new Weston Marsh A and/or the new Weston Marsh Substation B, resulting in changes in the	The Project will be designed to be located close to areas of existing vegetation to screen views of the substation(s), overhead lines and pylons to help to integrate the new infrastructure and reduce its	The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.	Adverse effect	High

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
<p>character and perception of the landscape. It would be further influenced by the new 400 kV overhead line.</p>	<p>visibility within the broader landscape.</p> <p>Any planting will seek to utilise native trees and shrubs, where practicable, around the perimeter of the substation(s).</p>			
<b>Visual</b>				
<p>The community of Moultons Parish would be impacted by the presence of the new Weston Marsh A and/or the new Weston Marsh Substation B as well as the new overhead line and its associated pylons, resulting in changes to views from receptor locations. The Parish would also be indirectly impacted by the presence of the new overhead line located outside of the community area causing visual changes to the landscape.</p>	<p>The Project will be designed to be located close to areas of existing vegetation to screen views of the substation(s), overhead lines and pylons to help to integrate the new infrastructure and reduce its visibility within the broader landscape.</p> <p>Any planting will seek to utilise native trees and shrubs, where practicable, around the perimeter of the substation(s).</p>	<p>The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p>	Adverse effect	High
<p>The Weston Parish would be directly impacted by the visual presence of</p>			Adverse effect	High



Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
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approximately 5-6 km of new overhead line and the presence of the new Weston Marsh A and/or the new Weston Marsh Substation B, resulting in changes to views from receptor locations.

## Ecology and Biodiversity

### Designated Sites

<p>Birds species which are qualifying features of the following designated sites may be impacted by the presence of overhead line resulting in collision mortality:</p> <ul style="list-style-type: none"> <li>• The Wash Special Protection Area (SPA) and Ramsar Site;</li> <li>• Nene Washes SPA and Ramsar Site; and</li> <li>• The Wash SSSI.</li> </ul>	<p>The design of the substation(s), new overhead line, pylons and permanent access routes will be positioned to avoid or reduce direct and indirect impacts on notable habitats and species, as far as reasonably practicable.</p>	<p>The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.</p>	<p>Significant adverse effects cannot be excluded at this stage.</p>	<p>Low - survey works are ongoing and will inform further assessment of impacts and effects and the design of any required mitigation measures. The potential for LSE upon European Sites will be assessed within the Report to Inform the Habitat Regulations Assessment, informed by discussions with Natural England other statutory bodies.</p>
<p>Internationally designated sites within the Section 5 Study Area may be impacted by operational activities causing changes</p>	<p>The design of the substation(s), new overhead line, pylons and permanent access routes will be positioned to avoid or</p>	<p>The assessment does not consider additional measures as they are yet to be developed due to the</p>	<p>Significant adverse effects cannot be excluded at this stage.</p>	

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
in flow regimes, including the volume of water supplied, water depth and water flow rates which may lead to indirect impacts on species in these sites.	reduce direct and indirect impacts on notable habitats and species, as far as reasonably practicable.	preliminary nature of the design, for Section 5.		
<b>Protected and Notable Species</b>				
Wintering and breeding birds may be impacted by the presence of overhead line resulting in collision mortality.	The design of the substation(s), new overhead line, pylons and permanent access routes will be positioned to avoid or reduce direct and indirect impacts on notable habitats and species, as far as reasonably practicable.	The assessment does not consider additional measures as they are yet to be developed due to the preliminary nature of the design, for Section 5.	Significant adverse effects cannot be excluded at this stage.	Low - survey works are ongoing and will inform further assessment of impacts and effects and the design of any required mitigation measures.
<b>Historic Environment</b>				
No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.				
<b>Water Environment and Flood Risk</b>				
Third party flood risk receptors may impacted by the new Weston Marsh A and/or the new Weston Marsh Substation B within	Substation surface water drainage systems would provide attenuation of runoff from impermeable surfaces to greenfield rates and	The assessment does not consider additional measures as they are yet to be developed due to the	Moderate to Major adverse effect	Low - several factors require further assessment to inform the final Flood Risk Assessment, including review of existing flood models, informed

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
defended floodplain, resulting in the permanent loss of floodplain storage and/or change in floodplain flow conveyance (under conditions of flood defence overtopping or breach).	incorporate appropriate pollution prevention measures, incorporating the use of Sustainable Urban Drainage Systems (SuDS) as far as practicable.	preliminary nature of the design, for Section 5. Any additional mitigation measures may include provision of compensatory storage, subject to ongoing discussions with the Environment Agency.		by engagement with the Environment Agency.

### Geology and Hydrogeology

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

### Agriculture and Soils

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

### Traffic and Movement

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

### Noise and Vibration

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

### Socioeconomics, Recreation and Tourism

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

Description of receptor and potential impact	Key embedded and control measures	Proposed additional mitigation measures	Preliminary likely significant effects	Confidence rating (high/moderate/low)
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**Air Quality**

No likely significant effects are predicted as a result of the operation and maintenance of the Project, based upon the preliminary assessment.

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