The Great Grid Upgrade

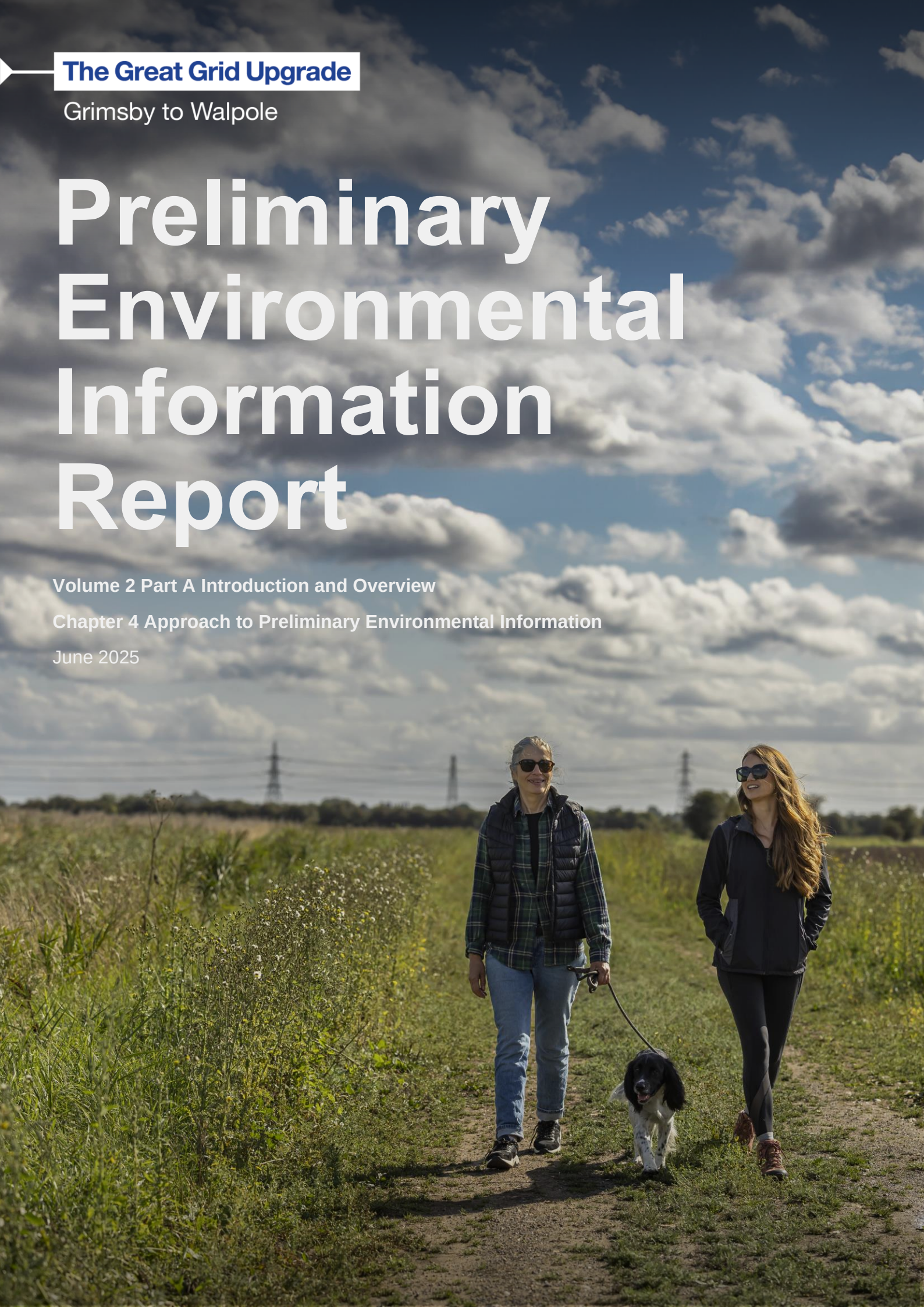
Grimsby to Walpole

Preliminary Environmental Information Report

Volume 2 Part A Introduction and Overview

Chapter 4 Approach to Preliminary Environmental Information

June 2025



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4. Approach to Preliminary Environmental Information

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4. Approach to Preliminary Environmental Information

4.1 Introduction

4.1.1 This chapter sets out the Environmental Impact Assessment (EIA) approach and general methodology that has been used in developing the preliminary environmental information for the Grimsby to Walpole Project (the Project), which is presented in this Preliminary Environmental Information (PEI) Report.

4.1.2 The PEI Report is intended to give consultees an understanding of the potential likely significant effects of the Project (positive or negative) to develop an informed view of the likely significant environmental effects of the Project so as to prepare well-informed responses to the statutory consultation. All conclusions and assessments in the PEI Report are by their nature preliminary and are based on the current, early Project design as described within this PEI Report. The full assessment will be presented within the Environmental Statement submitted with the DCO application.

4.1.3 This chapter should be read in conjunction with the following sections of this PEI Report, which provide further details as to the nature of the Project and the methodologies used in the assessments presented in this PEI Report:

i. **PEI Report Volume 2 Part A Chapter 1 Introduction**;

ii. **PEI Report Volume 2 Part A Chapter 5 Project Description**;

iii. **PEI Report Volume 2 Part A Figure 1.1 Draft Order Limits and Refined Weston Marsh Substation Siting Zone**;

iv. **PEI Report Volume 2 Part A Figure 4.1 Inter-Project Cumulative Effects Assessment Study Area**;

v. **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses**;

vi. **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**;

vii. **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration Within the Future Baseline**;

viii. **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**;

ix. **PEI Report Volume 3 Part A Appendix 4D Summary of Stakeholder Engagement;** and

x. **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice (CoCP)**.

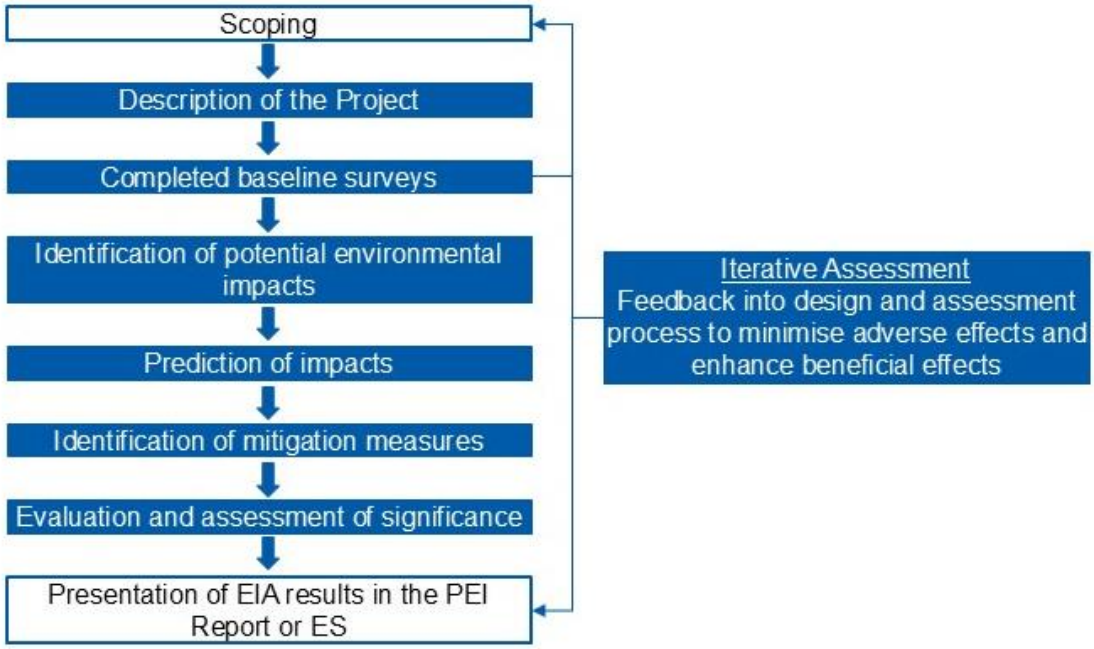
4.2 Environmental Impact Assessment and Preliminary Environmental Information Report Approach

What is Environmental Impact Assessment?

4.2.1 EIA is the process of compiling, evaluating, and presenting information about the likely significant environmental effects, both adverse and beneficial, of a project. The assessment is designed to provide decision makers and statutory consultees with the environmental information they require during determination of an application for development consent. The early detection of likely significant adverse environmental effects enables appropriate mitigation (i.e. measures to avoid, reduce or offset likely significant adverse effects) to be identified and incorporated into the design of a project, or commitments to be made, for example to environmentally sensitive construction methods and practices.

4.2.2 The main stages of the EIA process and the iterative nature of assessment and design are illustrated in **Image 4.1**.

Image 4.1 Environmental Impact Assessment Process



4.2.3 The three main EIA documents which are produced as part the Development Consent Order (DCO) pre-application process are:

i. EIA Scoping Report: The EIA Scoping Report (Ref 1) identified the scope and level of detail of the information to be provided within the Environmental Statement (ES). It also set out the likely significant effects from the Project, the data to be utilised and the proposed assessment methodology and approach. Responses to the EIA Scoping Report were received on 10 September 2024 (Ref 2). **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses** summarises the key points raised within the

Scoping Opinion alongside how National Grid Electricity Transmission plc (National Grid) has or intends to address points raised.

ii. PEI Report (the current Project stage): the PEI Report sets out the information that 'is reasonably required for the consultation bodies to develop an informed view of the likely significant environmental effects of the development' (Ref 3). The PEI Report is used by consultees to inform their consultation responses during Statutory Consultation. The PEI Report is produced at a time when there may not be a full understanding of all environmental effects, and the detailed assessment may not have been undertaken. The PEI Report sets out the level of work undertaken to reach the conclusion as to whether there are likely to be significant effects for each aspect identified as being within the scope of the assessment. It also outlines any further work to be presented in the ES to validate these conclusions.

iii. Environmental Statement (ES): The ES presents environmental information relating to the Project to enable EIA to be carried out and a decision made on whether to grant development consent. It identifies the likely significant effects that would result if the Project was implemented, and any proposed mitigation to reduce those significant effects. The ES is submitted as part of the application for development consent and is taken into account during the decision-making process.

4.2.4 To secure the environmental mitigation that is required for the Project, as identified within the ES, an Preliminary CoCP will accompany the DCO application. The Preliminary CoCP will be supported by relevant outline or draft Environmental Control Plans (ECPs). ECPs will be prepared to accompany the Preliminary CoCP which will be implemented during the construction of the Project and in some instances during the operation of the Project. The ECPs will detail further topic specific environmental measures to avoid, reduce or compensate for any detrimental effects on the environment - for example the Site Waste Management Plan (SWMP), which details how materials will be managed efficiently during construction.

4.2.5 It should be noted that the ECPs will not be submitted as part of this PEI Report but they will be provided as part of the final ES and DCO application. The DCO application will secure these documents as a requirement whereby they must be complied with during the relevant future stages of the Project that they apply to such as construction and operation. The anticipated ECPs are described in **Table 4.1**.

Table 4.1 Environmental control plans

Plan	Description
Construction Environmental Management Plan (CEMP)	To detail how to mitigate and manage the identified environmental impacts during the construction of the Project.
Landscape Ecological Management Plan (LEMP)	To detail how habitats and other ecological enhancements will be managed and maintained throughout the Project lifecycle.
Site Waste Management Plan (SWMP)	To detail how materials will be managed efficiently and disposed of legally during the construction of the Project.
Construction Traffic Management Plan (CTMP)	To detail the environmental and traffic control measures which may be implemented in relation to the traffic generated during the construction phase for the Project.

Plan	Description
Public Rights of Way Management Plan (PRoWMP)	To detail management and environmental measures strategy for all Public Rights of Way (PRoW) and Open Access Land affected by the Project.
Overarching Written Scheme of Investigation (WSI)	To detail required measures to mitigate direct adverse impacts to the historic environment.
Soil Management Plan (SMP)	To detail management measures to minimise adverse effects on the soil resource.

4.2.6 For the purposes of this PEI Report a Preliminary CoCP has been prepared in parallel with the preliminary design see **PEI Report Volume 3 Part A Appendix 5A Preliminary Code of Construction Practice**. The Preliminary CoCP includes the preliminary control and management measures which have been identified within this PEI Report. It also sets the foundation for which the Preliminary CoCP will follow.

PEI Report Approach

4.2.7 Regulation 12(2) of the EIA Regulations defines the PEI Report 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)*"(Ref 3).

4.2.8 In relation to PEI Report, Planning Inspectorate Advice Note Seven (Ref 4) states that:

> *"There is no prescribed format as to what PEI should comprise and it is not expected to replicate or be a draft of the ES. However, if the Applicant considers this to be appropriate (and more cost effective) it can be presented in this way….. A good PEI document is one that enables consultees (both specialist and non-specialist) to understand the likely environmental effects of the Proposed Development and helps to inform their consultation responses on the Proposed Development during the pre-application stage".*

4.2.9 This PEI Report therefore provides a preliminary assessment for each environmental topic to inform Statutory Consultation. Each chapter within **PEI Report Volume 2 Part B and Part C** outlines methodology, baseline, mitigation and residual effects (including a prediction of likely significant effects) informed by the EIA Scoping Report and Scoping Opinion.

4.2.10 This PEI Report follows a receptor-based assessment approach (unless otherwise stated in each chapter). When deciding on which receptors to include within the PEI Report, consideration was given to Regulation 5(2) and Schedule 4 paragraph 4 of the 2017 EIA Regulations.

4.2.11 All conclusions and assessments presented within this PEI Report are preliminary and are based on the Project design and assumptions described within this PEI Report. All assessment work has and continues to apply a precautionary principle, in that where limited information is available, a realistic worst-case scenario is assessed.

4.2.12 The PEI Report sets out the level of work undertaken to reach the conclusion as to whether there are likely to be significant effects for each scoped in aspect. It also outlines any further work to be presented in the ES to validate conclusions.

4.3 Overview of the Environmental Impact Assessment Scoping Stage

4.3.1 The process of scoping and the preparation of a 'Scoping Report' is the main mechanism for determining the 'scope' of the EIA i.e., what environmental aspects will be considered, what methods of assessment will be used, and how conclusions will be reached regarding the significance of environmental effects.

4.3.2 The EIA Scoping Report for the Project was issued to the Planning Inspectorate in August 2024 and the Scoping Opinion was received on 10 September 2024. The Scoping Opinion takes account of responses from prescribed consultation bodies, relevant statutory undertakers, Local Authorities and non-prescribed consultation bodies as appropriate. **Planning Inspectorate Scoping Opinion Responses** summarises the key points raised within the Scoping Opinion and other stakeholder engagement activities alongside how National Grid has or intends to address points raised.

4.4 The 'Rochdale Envelope' and Limits of Deviation

4.4.1 Major infrastructure projects such as linear infrastructure projects for overhead lines, typically need some flexibility to be maintained for detailed design and construction, to provide for conditions that would otherwise prevent or delay construction or to respond to changes in circumstance. Examples can include previously unknown archaeological assets which interact with the location of proposed pylons or the emergence of changed technology or technical requirements.

4.4.2 In addition to this, flexibility is likely to be required for non-linear aspects of the Project, for example the layout of Substations. Design parameters are therefore required to state the maximum dimensions and potential locations within the compound.

4.4.3 PlNS Advice Note Nine (Ref 5) provides guidance on how to deal with flexibility of this type as follows:

> *"The Rochdale Envelope assessment approach is an acknowledged way of assessing a Proposed Development comprising EIA development where uncertainty exists and necessary flexibility is sought."*

4.4.4 To accommodate the necessary flexibility, a spatial tolerance will be applied to the relevant works. The extent of this tolerance is known as the 'limits of deviation' or LoD. The LoDs provide the parameters for the Rochdale Envelope approach in respect of these works. Other flexibilities may be required, but in each case they would be constrained by the Preliminary CoCP and/or the proposed DCO. Those constraints, such as hours of working, can also provide parameters for the Rochdale Envelope.

4.4.5 As acknowledged by the advice note, this approach allows for a realistic worst-case assessment to be undertaken and is the basis for the preliminary assessment reported within this PEI Report. By developing a realistic worst-case scenario, it is

possible to strike a balance between the level of design information needed for the purpose of EIA and the application for consent, while still retaining a level of design flexibility needed as the Project moves into detailed design and construction.

4.4.6 At this stage only preliminary environmental information is being provided, as the design of the Project, and the LoDs to be applied for, have not been finalised. However, the principles and assumptions that are currently envisaged to be applied in respect of the LoD (which are considered within this PEI Report), are detailed within **PEI Report Volume 2 Part A Chapter 5 Project Description.**

4.4.7 Each of the technical assessments described in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** includes a section, which sets out the assumptions that have been made in respect of the design flexibility maintained within the Project, where required.

4.5 Preliminary Environmental Information Report Assessment Approach

4.5.1 The following describes the methodology used to assess the potential effects on the natural, human and built environment as a result of the Project. In accordance with the EIA Regulations, the assessments undertaken evaluate and identify the likely significant environmental effects arising from the proposed construction, operation and maintenance of the Project.

4.5.2 With the exception of the decommissioning (in full or in part) of the existing Grimsby West Substation as part of the construction phase of the Project, decommissioning has been scoped out of the assessment. This approach was proposed in the Scoping Report (Ref 1) and agreed as part of the Scoping Opinion (Ref 2) .

4.5.3 At this preliminary stage, the PEI Report does not detail the likely methods for decommissioning the existing Grimsby West Substation or provide an assessment of effects, which will be presented in the ES.

4.5.4 The scope of the assessment is based on that which was presented within the Scoping Report and also reflects any responses provided in the Scoping Opinion. Where the Planning Inspectorate has identified that aspects should be scoped back into the assessment, these have been included within the assessment presented in this PEI Report and will be included within the ES. **PEI Report Volume 3 Part A Appendix 4A Planning Inspectorate Scoping Opinion Responses** summarises the key points raised within the Scoping Opinion alongside how National Grid has or intends to address points raised.

Technical Scope

4.5.5 The technical scope of assessment for each environmental aspect is detailed in **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. The appendix also details the approach to baseline data collection, assessment guidance and methodologies as well as any assessment assumptions and limitations. This is the basis for the assessments presented in this PEI Report.

Spatial Scope

4.5.6 The spatial scope for each environmental aspect is the geographical area over which changes to the environment could potentially occur as a result of the Project.

4.5.7 Each environmental topic chapter applies a buffer to the draft Order Limits (or in the case of Section 5, the Refined Weston Marsh Substation Siting Zone boundary), if required, to determine the extent of the Study Area. The Study Area proposed for each environmental topic comprises an area sufficient to encompass the spatial extent over which impacts relevant to that environmental topic and the related receptors may occur. **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope** describes the Study Area to be considered for each environmental topic, providing a clear explanation as to why the Study Area has been adopted.

4.5.8 The spatial scope for each environmental aspect depends on the nature of the potential effects and the location of receptors that could be affected. The spatial scope takes account of:

i. the extent and location of the Project;

ii. the nature of the baseline environment;

iii. the manner and extent to which environmental effects may occur; and

iv. relevant guidance, best practice and/or legislation.

4.5.9 It should be noted that the spatial scope may be refined within the ES following statutory consultation.

Temporal Scope

4.5.10 Subject to gaining development consent, construction works would be expected to start in 2029 and be completed by 2033.

4.5.11 This PEI Report predicts the changes (effects) to the current and future baseline that would occur during the construction and operation phases of the Project. The general approach is summarised below and any variations from this are discussed in the relevant environmental topic chapters:

i. Baseline year: the baseline is the reference level of the environmental conditions without implementation of the Project, against which the potential effects of the Project are assessed. The baseline year is 2024, when the majority of baseline surveys are to take place. For certain environmental topics the baseline environment is expected to change over time, and for these environmental topics this change has been predicted to enable robust identification of the effects of the Project against a future baseline. The future baseline is the projection of the environmental baseline to a future year to allow comparison of the environment with and without the Project taking place. For instance, vegetation growth, expected change in traffic levels or increase in weather events would be considered.

ii. Construction Phase: these are effects that are likely to occur during the construction phase of the Project. This will include effects resulting from the activities associated with installation of the Overhead Line, substations and works to facilitate the connection of the Overhead Line into the new Grimsby

West Substation, the new Lincolnshire Connection Substation A and Lincolnshire Connection Substation B, the new Weston Marsh Substation A and Weston Marsh Substation B; and the new Walpole Substation (Walpole B Substation). It also includes effects associated with the temporary works such as access tracks, haul roads, construction compound areas and work activities.

iii. Operational Phase: these are effects that will potentially occur as a result of the presence, operation and maintenance of the Project.

4.5.12 For the purposes of the cumulative effects assessment presented in **PEI Report Volume 2 Part C Chapter 10 Cumulative Effects** a long list and shortlist have been prepared. During this initial search, developments where construction has already commenced and/or where the development is likely to be completed prior to the Project's indicative construction start date have not been included in the long list. These developments will be considered as part of the future baseline of each individual topic assessment within the ES. **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope Annex A Developments for Consideration Within the Future Baseline** presents a list of developments to be considered as part of the future baseline of each individual topic assessment. This will be conducted as part of the ES.

4.5.13 The Scoping Report proposed that decommissioning was scoped out of the assessment. The exception to this is where decommissioning works are proposed at the existing Grimsby West Substation (in part, or in full) as part of the construction phase of the Project. This approach was confirmed in the Scoping Opinion.

4.5.14 The environmental assessment uses defined temporal scales to characterise the duration of potential effects. For the purposes of assessment, the following definitions are applied unless otherwise defined in the specific environmental topic chapter:

i. Permanent – these are effects that will remain even when the Project is complete, although these effects may be caused by environmental changes that are permanent or temporary.

ii. Temporary – these are effects that are related to environmental changes associated with a particular activity and that will cease when that activity finishes or environmental changes which are reversible upon completion of an activity.

4.5.15 Both the Landscape and Visual assessments classify permanent effects as short-term, medium-term, or long-term. For further details, refer to **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope**. This classification ensures that the transient and seasonal characteristics of these effects are accounted for and documented within the assessments. For example, as landscape planting matures, the visual impacts on receptors may diminish over time, reducing in magnitude from short-term to long-term as the screening effect becomes more effective for affected receptors

4.5.16 For the purposes of the Landscape and Visual assessment, duration is determined in relation to the phases of the Project, as follows:

i. Short-term - assumed to cover construction plus one-year reinstatement;

ii. Medium-term - assumed to be 2 to 15 years post construction and include the effects of permanent vegetation loss on the baseline environment; and

iii. Long-term - assumed to be of a duration that extends longer than 15 years post construction when any committed mitigation planting has achieved its design intention.

4.5.17 It should be noted that all other environmental assessments consider the duration of the effect within their assessments, however, they do not apply such a scale.

4.5.18 The temporal nature of effects could be different to the phase in which the effects occur. For example, effects as a result of vegetation clearance during construction may be felt for a number of years after construction has been completed, before any replanted habitats have matured. For the purposes of the PEI Report, the effects are described under the phase within which the impact arises, (i.e. in the above example, vegetation loss will be assessed in the construction phase). This approach will also be adopted in the ES.

4.5.19 Each environmental topic chapter defines the baseline (current or future or both) against which the environmental effects of the Project will be assessed. The baseline conditions to be assessed for each environmental topic are outlined in each environmental topic chapters within **PEI Report Volume 2 Part B Section Specific Assessments and PEI Report Volume 2 Part C Route-wide** of this PEI Report.

Approach to Mitigation and Enhancements

4.5.20 A number of measures would be adopted as part of the Project to avoid and reduce the likely significant effects that would be experienced during implementation. Each environmental topic chapter of the PEI Report has identified proposed mitigation measures that are required to avoid or reduce the potential significant adverse effects of the Project. These fall into one of three categories as detailed below.

i. **Design mitigation measures** are those that are intrinsic to and built into the design. Design measures may include, for example, working within the existing topography to reduce pylon visibility and reducing habitat loss by minimising land take. They can also include the avoidance of designated sites through sensitive routeing, siting and design. Any such measures are described in **PEI Report Volume 2 Part A Chapter 5 Project Description** and in **PEI Report Volume 2 Part B Chapter 1 Overview of the Section and Description of the Project** in respect of each Section.

ii. **Control management measures** comprise management activities, control measures and techniques, that would be implemented during construction of the Project to limit impacts. They include adherence to good site practices and achieving legal compliance. The control and management measures to address construction-related impacts are described in each of the environmental topic chapters and are detailed in **PEI Report Volume 3 Part A Appendix 5A Preliminary Outline Code of Construction Practice (CoCP)**. In addition, licenses through separate regimes may be required. For example, ecological licences and assents granted by Natural England and various permits relating to water and waste granted by the Environment Agency. On the assumption that the regulatory authorities would not permit the works unless the potential impacts have been appropriately managed, it is assumed that these licensable activities are considered measures adopted as part of the Project.

iii. **Additional Mitigation Measures** 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, for

example landscape planting. Any additional mitigation measures have been described within each environmental topic chapter as well as **PEI Report Volume 2 Part A Chapter 5 Project Description** and in **PEI Report Volume 2 Part B Chapter 1 Overview of the Section and Description of the Project** in respect of each Section.

4.5.21 All three categories of mitigation will be the subject of a DCO requirement, which is a provision in the DCO that will make the mitigation mandatory, so that there will be a legal requirement to implement them. As such no assessment of likely significant effects has been undertaken prior to the application of mitigation as all mitigation will be a legal requirement.

4.5.22 Environmental enhancements are measures incorporated into the design which are over and above those that are required to mitigate the potential environmental effects of the Project. Any opportunities for environmental enhancement over and above the required mitigation measures (if identified) and Biodiversity Net Gain (BNG) will be outlined within the ES.

Assessment of Effects and Determination of Significance

4.5.23 Regulation 5(2) of the EIA Regulations (Ref 3) states that:

> *"the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors: (a) population and human health, (b) biodiversity…, (c) land, soil, water, air and climate, (d) material assets, cultural heritage and the landscape; e) the interaction between the factors referred to in sub-paragraphs (a) to (d)."*

4.5.24 Schedule 4 paragraph 5 of the EIA Regulations (Ref 3) requires a description of the likely significant effects of the development on the environment. The assessment of the significance of effects for the majority of environmental topics presented within this PEI Report follows the steps set out in the below paragraphs. Any environmental topics which deviate from the approach outlined have described their approach within **PEI Report Volume 3 Part A Appendix 4B Environmental Impact Assessment Methodologies and Scope.**

Identification of potential effects

4.5.25 The likely effects (beneficial and adverse) of the Project have been predicted and evaluated using appropriate evaluative techniques, many of which follow specific best practice guidelines for a particular environmental topic. Potential effects have been identified first, usually in summary, as an indication of what effects could theoretically occur in the absence of mitigation (other than mitigation inherent in the design of the Project).

Assessing effects and determining residual significance

4.5.26 There is no statutory definition of what constitutes a "significant" effect within the EIA Regulations. Defining what is significant involves consideration of two aspects of a potential effect, namely the sensitivity and/or value of the receptor or resource, and the magnitude of the impact on the receptor/resource.

4.5.27 The significance of the residual effects (those that are predicted to remain after both the control and management measures and environmental mitigation measures have been implemented) will then be determined by reference to criteria for each environmental topic. Specific significance criteria for each technical discipline will give due regard to the following:

i. scale of the impact;

ii. impact duration, and whether effects are temporary, reversible (i.e. whether the environmental change can be reversed through restoration actions or regeneration), or permanent;

iii. effect nature (whether direct or indirect, reversible or irreversible, beneficial or adverse);

iv. whether the effect occurs in isolation, is cumulative, or will interact with other effects;

v. performance against any relevant environmental quality standards;

vi. sensitivity of the receptor; and

vii. compatibility with environmental policies.

4.5.28 Each environmental topic chapter of this PEI Report includes a description of the approach taken to determine the significance of effects, including how professional judgement may be applied. The environmental topic chapters use the terminology for magnitude, sensitivity and significance described in the following sections unless there is a need to deviate due to specific environmental topic guidance. Where there is a requirement to deviate this justification is provided within the environmental topic chapter.

Magnitude of impact

4.5.29 General criteria for defining the magnitude of an impact, or change, are set out in **Table 4.2**. Key factors that influence this include:

i. scale of change – the scale of change refers to the degree of change to or from the baseline environment caused by the impact being described.

ii. spatial extent – the spatial extent is the full area over which the impact occurs.

iii. duration and frequency – the duration is a measure of how long the impact is expected to last. Frequency refers to how often the impact would occur; it may be continuous or periodic.

Table 4.2 Impact magnitude criteria

Magnitude	General criteria
Large	Adverse: Loss of resource and/or quality and integrity of resource; severe damage to key characteristics, features, or elements. Beneficial: Large scale or major improvement of resource, including extensive restoration or major improvement of attribute quality.
Medium	Adverse: Loss of resource, but not adversely affecting the integrity; partial loss of/damage to key characteristics, features or elements.

Magnitude	General criteria
	Beneficial: Benefit to, or addition of, key characteristics, features or elements; improvement of attribute quality.
Small	Adverse: Some measurable change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements. Beneficial: Minor benefit to, or addition of, one (maybe more) key characteristics, features or elements; some beneficial impact on attribute or a reduced risk of negative impact occurring.
Negligible	Adverse: Very minor loss of detrimental alteration to one or more characteristics, features or elements. Beneficial: Very minor benefit to or positive addition of one or more characteristics, features or elements.
No change	No adverse or beneficial change from baseline conditions.

Sensitivity and value of the receptor

4.5.30 The sensitivity of a receptor or feature is characterised by its vulnerability to change and its ability to recover. The value of a receptor or feature reflects its overall importance and the value placed on it by society; this may be reflected by its level of statutory or policy protection or value may be attributed through consultation and the application of professional judgement. Criteria for defining the sensitivity and/or value of a receptor are set out in **Table 4.3**. Characterisation of the receptor is achieved by balancing out these considerations to determine the receptor's sensitivity:

i. vulnerability – the vulnerability of the receptor relates to its capacity to accommodate change i.e. the tolerance/intolerance of the receptor to change;

ii. recoverability – the ability of the receptor to return to the baseline state; and

iii. importance – the importance of the receptor or feature is a measure of the value assigned to that receptor based on biodiversity and ecosystem services, social value and economic value. Importance of the receptor is also defined within a geographical context, whether it is important internationally, nationally or locally.

Table 4.3 Sensitivity and value criteria

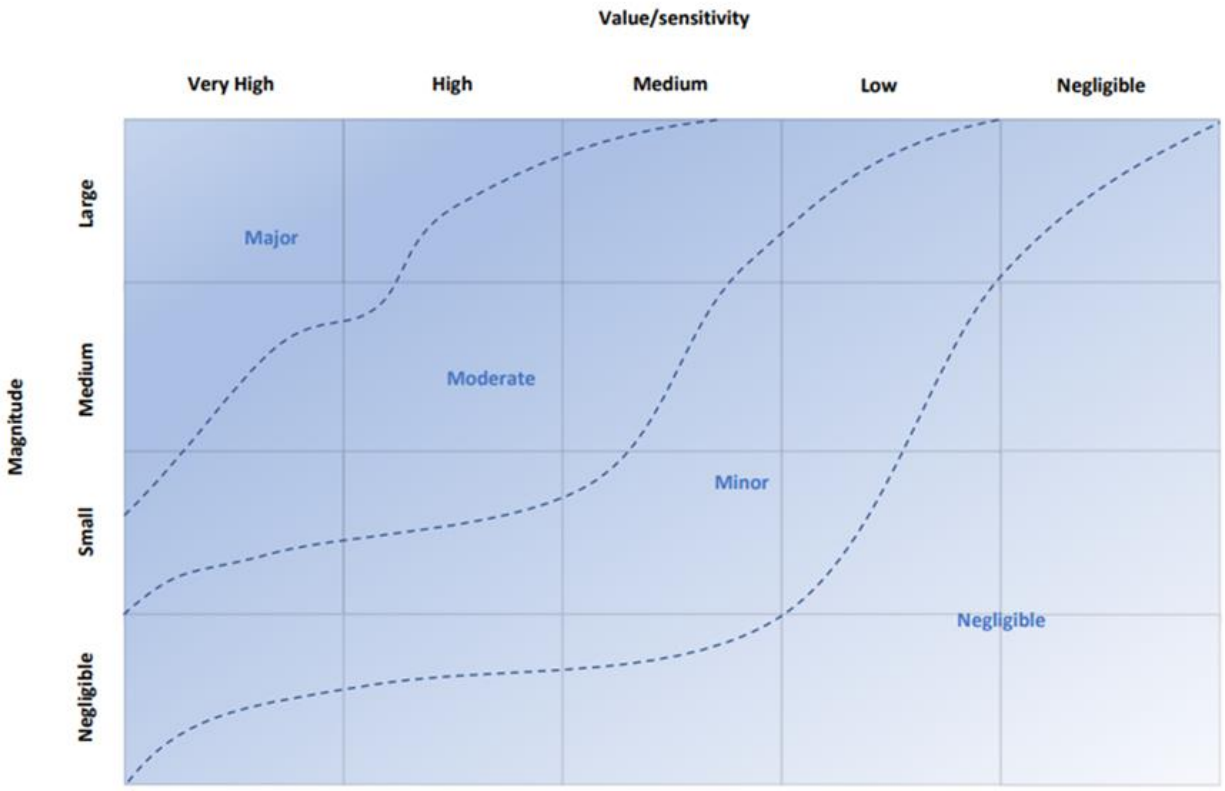
Sensitivity and Value	General criteria
Very High	Very high importance and rarity, value at an international level. The receptor has limited potential for recovery or substitution and has little to no capacity to accommodate change. As such the receptor would have a higher vulnerability.
High	High importance and rarity, value at a national level. The receptor has limited potential for recovery or substitution and has little capacity to accommodate change.

Sensitivity and Value	General criteria
Medium	Medium importance and rarity, value at a regional level. The receptor has limited potential for recovery or substitution or has a moderate capacity to accommodate change.
Small	Low or medium importance and rarity, value at local level. The receptor is not particularly sensitive change or has the capacity to accommodate change. As such the receptor would have a lower vulnerability.
Negligible	Not considered to be important and is considered to be easy to replace and as such is deemed to have the lowest vulnerability of all categories described in **Table 4.3**.

Evaluating the significance of effects

4.5.31 Having established the magnitude of change and sensitivity and value of the receptor, the significance of an effect can be assessed. To aid transparency in the assessment process, the matrix shown in **Image 4.2** will be used as the basis for assigning significance to an effect; however, the identification of significance typically requires the application of professional judgement. As an illustration, a high sensitivity receptor subject to a large magnitude of change would experience a major or (in some circumstances) moderate effect, and a low sensitivity receptor subject to a small magnitude of change would experience a minor or negligible effect, dependent upon the circumstances.

Image 4.2 Basis of assigning significance



4.5.32 Each of the specialist disciplines will apply magnitude and sensitivity criteria that best suit the environmental topic area, and for some environmental topics these may be defined in industry guidelines.

4.5.33 Following the classification of an effect using the methodology, a clear statement will then be made as to whether that effect is significant or not significant. Major and moderate effects are typically considered to be significant, whilst minor and negligible effects are considered to be not significant. However, professional judgement will also be applied in reaching conclusions as to the significance of effects. Typical definitions for the classification of effects are shown in **Table 4.4.**

4.5.34 For this PEI Report an Appraisal Summary Table has been prepared for each environmental topic and these are provided as an appendix to each environmental topic chapter. Each table details the outcome of the assessment undertaken for a specific environmental topic. Where a significant effect is identified as part of the assessment this is reported in more detail within the environmental topic chapter.

Table 4.4 Classification of effects

Significance	General criteria	Significant effect
Major	A large and detrimental change to a valuable/sensitive receptor commonly resulting in the loss of the receptor	**Yes**

Significance	General criteria	Significant effect
	and/or a large change in its quality and integrity, key features or elements. A large and beneficial change, resulting in improvements to the baseline or a major contribution being made to national targets. These effects may represent key factors in the determination of the DCO application. Potentially associated with sites and features of international and national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features that are unique and which, if lost, cannot be replaced or relocated.	
Moderate	A medium scale change that, which may not result in the total loss of a receptor but, is still considered to be generally unacceptable, unless balanced out by other significant positive benefits of a project A positive moderate effect is a medium scale change that is significant in that the baseline conditions are improved to the extent that guideline targets (e.g. UK BAP targets) are contributed to. These effects, if adverse, are likely to be important at a regional scale and on their own could have a material influence on decision making.	**Yes (typically)**
Minor	A small change in key features or elements where a partial loss of the receptor may be evident. A small positive change, but not one that is likely to be a key factor in the overall balance of issues. These effects may be raised as local issues and may be of relevance in the detailed design of a project but are unlikely to be critical in the decision-making process.	**No**
Negligible	A very small change that is so small and unimportant that it is considered acceptable to disregard. Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error, these effects are unlikely to influence decision making, irrespective of other effects.	**No**

Residual effects

4.5.35 Residual effects are those that are predicted to remain after both the control and management measures and environmental mitigation measures have been implemented. These will be described at the end of each environmental topic chapter within the PEI Report.

4.6 Cumulative Effects

Introduction

4.6.1 The following section outlines the assessment approach that has been adopted for this PEI Report in regard to the assessment of cumulative effects. It provides the basis of the assessment which is found in **PEI Report Volume 2 Part C Chapter 13 Cumulative Effects.**

4.6.2 Cumulative effects are the result of multiple actions on environmental receptors or resources. The cumulative effects assessment of the Project will consider the following types of effect:

i. Intra-project cumulative effects (sometimes referred to as combined or interactive effects): these effects occur where a single receptor is affected by more than one source of effect from the Project.

ii. Inter-project cumulative effects: these effects occur where a single receptor is affected by effects from a number of developments, including the Project. This includes effects which individually might not be of significance, but when considered together could create a significant cumulative effect on a shared receptor when considered together with the Project.

4.6.3 As set out in **PEI Report Volume 2 Part A Chapter 5 Description of the Project** various projects are currently identified as expected to connect to the proposed substation infrastructure. The connections will either be network reinforcements or customer connections. National Grid is currently working closely with a number of these projects to provide a co-ordinated approach to project development, where possible. Any such developments will be considered, alongside any other identified developments for consideration, as part of the inter-project cumulative effects.

4.6.4 The cumulative effects assessment will be based on publicly available data relating to proposed and committed developments as set out in the Planning Inspectorate's Advice Note Seventeen (Ref 6) which are in the public domain or have been provided to the Project team. As far as possible, the Project team will collaborate with other developers and relevant statutory consultees, to identify information which may be pertinent to the cumulative effects assessment. A description of the cumulative effects methodology can be found within **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology.**

Legislation, Planning Policy and Technical Guidance

4.6.5 Schedule 4 the EIA Regulations (Ref 3) states that an ES is to include a description of the likely significant effects of a development on the environment, which should cover, amongst others, cumulative effects. Paragraph 5(e) of that Schedule describes cumulative as:

"the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".

4.6.6 In addition, Regulation 5(2)(e) of the EIA Regulations requires that the EIA considers the interaction of environmental effects associated with the Project. The inter-related effects assessment considers likely significant effects from multiple impacts and

activities from the construction, operation and maintenance of the Project on the same receptor, or group of receptors.

4.6.7 The Overarching National Policy Statement for Energy (NPS EN-1) (Ref 7) states at paragraph 4.3.3 that:

"The Regulations require an assessment of the likely significant effects of the proposed project on the environment, covering the direct effects and any indirect, secondary, cumulative, transboundary, short, medium and long-term, permanent and temporary, positive and negative effects at all stages of the project."

4.6.8 National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (Ref 8) provides environmental topic-specific guidance for electrical infrastructure including overhead lines but makes only limited reference to cumulative considerations. Paragraph 2.9.10 states that:

"Cumulative adverse landscape, seascape and visual impacts may arise where new overhead lines are required along with other related developments such as substations, windfarms and/or other new sources of generation."

4.6.9 Paragraph 116 of the National Planning Policy Framework (Ref 9) states that:

"Development should only be prevented or refused on highways grounds if there would be an unacceptable impact on highway safety, or the residual cumulative impacts on the road network, following mitigation, would be severe, taking into account all reasonable future scenarios "

4.6.10 Paragraph 198 states that:

"Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development"

4.6.11 Paragraph 199 states that:

"Planning policies and decisions should sustain and contribute towards compliance with relevant limit values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and Clean Air Zones, and the cumulative impacts from individual sites in local areas"

Approach to Cumulative Effects Assessment

4.6.12 Planning Inspectorate Advice Note Seventeen, Cumulative Effects Assessment (Ref 6), sets out a staged approach to cumulative effects assessment for Nationally Significant Infrastructure Projects and provides template formats for documenting the assessment within an applicant's ES.

4.6.13 Concurrently with professional judgement, the Inspectorate's Advice Note Seventeen (Ref 6) will be used to inform the scope of the cumulative effects assessment, and to assist the identification and mitigation of likely significant effects.

Intra-project cumulative effects

4.6.14 Intra-project cumulative effects (sometimes referred to as combined or interactive effects) occur where a single receptor is affected by more than one source of effect

or aspect of the Project. An example of an intra-project effect would be where a local community is affected by dust, noise, and traffic disruption during the construction

4.6.15 of the Project, with the result being a greater level of nuisance than each individual effect alone.

4.6.16 A useful summary of the principle of cumulative intra-project effects is provided by the Planning Inspectorate in Advice Note Nine: Rochdale Envelope (Ref 5).

> *"The ES should not be a series of separate unrelated topic reports. The interrelationship between aspects of the proposed development should be assessed and careful consideration should be given by the developer to explain how interrelationships have been assessed in order to address the environmental impacts of the proposal as a whole. It need not necessarily follow that the maximum adverse impact in terms of any one topic impact would automatically result in the maximum potential impact when a number of topic impacts are considered collectively. In addition, individual impacts may not be significant but could become significant when their interrelationship is assessed. It will be for the developer to demonstrate that the likely significant impacts of the project have been properly assessed".*

4.6.17 As described in detail within **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology**, a three-stage approach has been adopted for the assessment of intra-project cumulative effects. The three stages are outlined below:

i. a pre-screening exercise to determine whether a receptor is exposed to more than one type of effect;

ii. a screening exercise to identify the level of effect on each receptor; and

iii. the main intra-project assessment which will consider if the combination of effects is likely to lead to overall effects of greater significance.

4.6.18 As this PEI Report is presenting a preliminary assessment and some of the topics have not been able to confirm the level effect, an assessment of intra– project cumulative effects is not presented, as it is not possible to progress this assessment past stage 1.

4.6.19 A full assessment of intra–project cumulative effects following the three-stage approach set out in **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology** will be conducted and presented in the ES.

Inter-project cumulative effects

4.6.20 Inter-project cumulative effects occur where a receptor is affected by two or more projects at the same time, potentially amplifying the overall effect. Individually the effects may not be significant, but when considered together could create a significant cumulative effect.

4.6.21 In accordance with the approach contained within the Inspectorate's Advice Note Seventeen (Ref 6), the approach to the assessment of inter-project cumulative effects will follow a staged approach.

4.6.22 The methodology for how inter-project cumulative effects have been assessed within this PEI Report and how it will be assessed within the ES is provided in **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology.**

The Study Area for the cumulative effects assessment is shown on **PEI Report Volume 2 Part A Figure 4.1 Inter-Project Cumulative Effects Assessment Study Area.**

4.6.23 In summary the key stages of the assessment are:

i. Stage 1a: Identify the Zone of Influence;

ii. Stage 1b: Identify long list of other developments;

iii. Stage 2: Establishing a shortlist of other existing development and/or approved development;

iv. Stage 3: Information gathering; and

v. Stage 4: Assessment.

4.6.24 Stages 1A, 1B and 2 have been completed for this PEI Report and further information can be found in **PEI Report Volume 3 Part A Appendix 4C Cumulative Effects Assessment Methodology and PEI Report Volume 2 Part C Chapter 13 Cumulative Effects**. Stages 3 and 4 will be undertaken and presented in the cumulative effects chapter of the ES. In addition, as part of the PEI Report, a preliminary assessment has been undertaken to provide stakeholders with additional information regarding the potential for likely significant cumulative effects.

4.6.25 It should be noted that **PEI Report Volume 2 Part C Chapter 13 Cumulative Effects** contains an assessment matrix where each development within the shortlist, has been assessed by each technical discipline to identify if any likely significant inter project cumulative effects are likely. The chapter then provides a brief narrative as to why a topic considers there to be a potential for significant cumulative effects or not, which will be assessed in detail within the ES.

4.7 Monitoring

4.7.1 Schedule 4, Paragraph 7 of the EIA Regulations (Ref 3) states that, where appropriate, the ES should include a description of any proposed monitoring arrangements where likely significant residual effects have been identified. Given the preliminary stage of assessment that the Project is at, monitoring requirements will be identified by the environmental topics within their assessment where they are known. As the assessment develops the ES will detail the monitoring requirements which will include clear and proportionate objectives for monitoring, the parameters to be monitored, the methodology for the monitoring, a timescale for implementation, identification of the party who will be responsible for the monitoring, and an outline of the remedial actions to be undertaken should results be adverse.

4.8 Structure of the Technical Assessments within this Preliminary Environmental Information Report

4.8.1 The structure of the technical assessments contained within **PEI Report Volume 2 Part B Section Specific Assessments** and **PEI Report Volume 2 Part C Route-ide Assessments** of this PEI Report is set out in **PEI Report Volume 2 Part A Chapter 1 Introduction**.

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