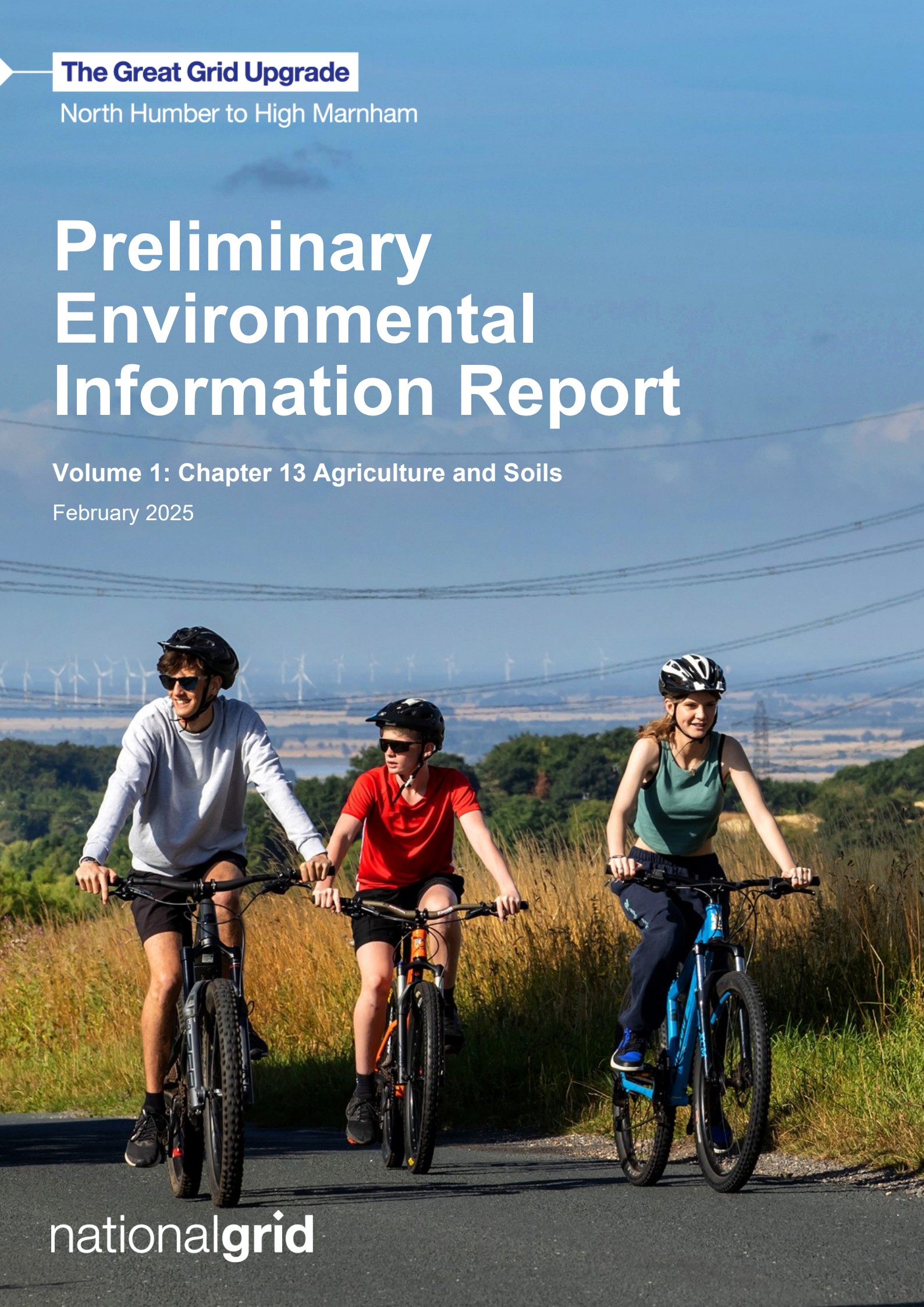
The Great Grid Upgrade

North Humber to High Marnham

Preliminary Environmental Information Report

Volume 1: Chapter 13 Agriculture and Soils

February 2025



nationalgrid

Contents

North Humber to High Marnham
Document Control

Document Properties	
Organisation	Arcadis
Author	Arcadis
Approved by	National Grid
Title	Preliminary Environmental Information Report Chapter 13 Agriculture and Soils
Document Register ID	NHHM-NG-ENV-REP-001
Data Classification	Public

Version History

Document	Version	Status	Description / Changes
Chapter 13	1.0	Final	First Issue

13. Agriculture and Soils

nationalgrid

13. Agriculture and Soils

13.1 Introduction

13.1.1 This chapter of the Preliminary Environmental Information Report (PEIR) presents information about the preliminary environmental assessment of the likely significant agriculture and soils effects identified to date, that could result from the proposed overhead line between the proposed Birkhill Wood Substation and the proposed High Marnham Substation as described in **Chapter 4 Description of the Project**.

13.1.2 **Chapter 1 Introduction** explains that the proposed Birkhill Wood Substation and proposed High Marnham Substation are proposed to be authorised through separate consenting procedures, however, they have also been included as part of the Project. As explained in **Chapter 5 Approach to Preparing the PEIR**, the environmental effects of these two substations including their associated overhead line reconfigurations, hereafter referred to as the Proposed Substation Works, have accordingly been considered within **Chapter 20 Substations and Associated Works**. For the purpose of this chapter the proposed overhead line between the proposed Birkhill Wood Substation and the proposed High Marnham Substation is hereafter referred to as the Proposed Overhead Line.

13.1.3 To ensure that the Project as a whole has been assessed a summary has been included within this preliminary assessment of the likely significant effects on agriculture and soils which brings together the assessment of the Proposed Overhead Line and Proposed Substation Works for this topic.

13.1.4 This chapter describes the methodology used, the datasets that have informed the preliminary assessment, baseline conditions, mitigation and the preliminary agriculture and soils residual significant effects that could result from the Proposed Overhead Line.

13.1.5 This chapter covers effects on the following during construction, operation and maintenance noting that decommissioning has been scoped out:

- Agricultural land (including Best and Most Versatile (BMV) agricultural land);
- Agricultural operations; and
- Soils.

13.1.6 This chapter should be read in conjunction with:

- **Chapter 4 Description of the Project**;
- **Chapter 5 Approach to Preparing the PEIR**; and
- **Chapter 20 Substations and Associated Works**

13.1.7 There are interrelationships between the potential effects on agriculture and soils and other environmental topics. Therefore, please also refer to the following chapters:

- **Chapter 8 Ecology**;
- **Chapter 11 Water Environment**;
- **Chapter 12 Geology and Hydrogeology;** and
- **Chapter 17 Socio-economics, Recreation and Tourism.**

13.1.8 This chapter is supported by the following figures in Volume 2:

- **Figure 13.1 Agriculture and Soils Study Area**;
- **Figure 13.2 Provisional ALC Mapping**;
- **Figure 13.3 Detailed ALC Mapping (Post-1988)**;
- **Figure 13.4 Agri-environmental Schemes**;
- **Figure 13.5 Forestry and Woodland Grant Schemes**; and
- **Figure 13.6 Soilscapes Mapping**.

13.2 Regulatory and Planning Context

13.2.1 This section sets out the legislation and planning policy that is relevant to the preliminary agriculture and soils assessment. A full review of compliance with relevant national and local planning policy will be provided within the Planning Statement that will be submitted as part of the application for Development Consent.

13.2.2 **Chapter 2 Regulatory and Planning Context** describes the overall regulatory and planning policy context for the Project. Key legislation, policy and planning guidance relevant to the assessment of potential agriculture and soils effects associated with the construction, operation and maintenance of the Project is presented below.

Legislation

13.2.3 The Agricultural Land (Removal of Surface Soil) Act 1953 (Ref 13.1) is the only relevant legislation that is specific to the assessment of soils and agriculture. The Act outlines the offense and punishment as a result of removing surface soil without planning permission from agricultural land.

National Policy Statements (NPSs)

13.2.4 **Chapter 2 Regulatory and Planning Context** sets out the overarching policy context relevant to the Project including the Overarching National Policy Statement for Energy (EN-1) (Ref 13.2). This is supported by the National Policy Statement for Electricity Networks Infrastructure (EN-5) (Ref 13.3

13.2.5 Paragraph 5.11.12 of EN-1 states *'Applicants should seek to minimise impacts on the best and most versatile agricultural land (defined as land in grades 1, 2 and 3a of the Agricultural Land Classification) and preferably use land in areas of poorer quality (grades 3b, 4 and 5)'*.

13.2.6 Paragraph 5.11.13 of EN-1 states *'Applicants should also identify any effects and seek to minimise impacts on soil health and protect and improve soil quality taking into account any mitigation measures proposed'*.

13.2.7 Paragraph 5.11.14 of EN-1 states '*Applicants are encouraged to develop and implement a Soil Management Plan which could help minimise potential land contamination. The sustainable reuse of soils needs to be carefully considered in line*

with good practice guidance where large quantities of soils are surplus to requirements or are affected by contamination[1]'.

13.2.8 Paragraph 5.11.34 of EN-1 states *'The Secretary of State should ensure that applicants do not site their scheme on the best and more versatile agricultural land without justification. Where schemes are to be sited on best and more versatile agricultural land the SoS should take into account the economic and other benefits of that land. Where development of agricultural land is demonstrated to be necessary, areas of poorer quality should be preferred to those of a higher quality'*.

13.2.9 EN-5 sets out limited policy in relation to soils and agriculture. In relation to electric and magnetic fields (EMFs) it states in paragraph 2.9.58 that *'There is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs has any agriculturally significant consequences*.

13.2.10 Paragraph 2.9.25 (final bullet point) of EN-5 in relation to proposals for undergrounding states that they should consider: *'…the applicant's commitment, as set out in their ES, to mitigate the potential detrimental effects of undergrounding works on any relevant agricultural land and soils (including peat soils), particularly regarding Best and Most Versatile land. Such a commitment must guarantee appropriate handling of soil, backfilling, and return of the land to the baseline Agricultural Land Classification (ALC), thus ensuring no loss or degradation of agricultural land. Such a commitment should be based on soil and ALC surveys in line with the 1988 ALC criteria and due consideration of the Defra Construction Code of Practice for Sustainable Use of Soils on Construction Sites'*.

Other National Policy

13.2.11 Although the Project will be tested in line with national policy stated above, the preliminary assessment has also been undertaken in accordance with, and with reference to, the following national legislation and policy:

- National Planning Policy Framework 2024 (Ref 13.4) (NPPF) and accompanying planning practice guidance
  - Paragraph 187 states '*Planning policies and decisions should contribute to and enhance the natural and local environment by….(b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;"*
  - Footnote 65 states *'Where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred to those of a higher quality.'*
- Environmental Improvement Plan 2023 (Ref 13.5)

Regional and Local Policy

13.2.12 **Chapter 2 Regulatory and Planning Context** lists relevant regional and local policy documents. Key local policies relevant to agriculture and soils that have informed this preliminary assessment, and will inform the assessment reported in the ES, comprise:

[1] For guidance, see the Defra Code of practice for the sustainable use of soils on construction sites.

- East Riding Local Plan 2012-2029, Adopted 2016 (Ref 13.6)
  - Policy EC5: Supporting the energy sector
- North Lincolnshire Local Development Framework Core Strategy 2006 – 2026, Adopted 2011 (Ref 13.7)
  - Spatial Objective 7: Efficient Use and Management of Resources
  - CS2: Delivering More Sustainable Development
- Draft North Lincolnshire Local Plan (Ref 13.8
  - Spatial Objective 12: Efficient Use of Our Resources
  - Policy SS3: Development Principles
  - Policy RD1: Supporting sustainable development in the countryside
- Bassetlaw Local Plan 2020-2037, Adopted 2024 (Ref 13.10)
  - 4.15 (Strategic Objectives)
  - Policy ST1: Bassetlaw's Spatial Strategy

13.2.13 North Lincolnshire Council submitted the New Local Plan for Examination in November 2022. The Examination progressed however the authority took the decision to formally withdraw the New Local Plan from the Examination in September 2024. The Saved Policies in the Local Plan (2003) as updated in October 2024 (Ref 13.34) North Lincolnshire Local Development Framework Core Strategy (2011) (Ref 13.7 from the adopted Development Plan and have been considered in the PEIR where relevant.

13.3 Scoping Option and Consultation

Scoping Opinion

13.3.1 The scope of the assessment has been informed by the Scoping Opinion (Ref 13.10) provided by the Planning Inspectorate on behalf of the Secretary of State, following submission of the Environmental Impact Assessment (EIA) Scoping Report (Ref 13.11). The scope has also been informed through consultation and engagement with relevant stakeholders.

13.3.2 A summary of the Scoping Opinion (Ref 13.10) together with a response from National Grid against each point of relevance to agriculture and soils is provided in Table 13.1.

Table 13.1 - Scoping Opinion comments

ID	Inspectorate's comments	Response
3.7.1	**Temporary acquisition of land to accommodate construction activities (temporary disruption to land holdings and loss of income to farm businesses)** The Applicant proposes to scope this matter out on the basis that the measures outlined in Section 12.5 would reduce the potential	Noted. The appropriate mitigation measures will be detailed in the Code of Construction Practice (CoCP) which will be submitted with the application for development consent. A draft outline CoCP

ID	Inspectorate's comments	Response
	for temporary disruption and any residual disruption to loss of income from farm businesses would be dealt with through compensation agreements which lie outside of the scope of the EIA process. On the basis of these measures and compensation agreements being implemented, the Inspectorate agrees to scope these matters out from further assessment.	has been provided at **Appendix 4.1 Draft Outline CoCP** in Volume 3. Engagement with landowners is ongoing and agreements will be in place prior to construction commencing.
3.7.2	**Permanent acquisition of land to accommodate the operational Proposed Development** The Applicant proposes to scope this matter out on the basis that the measures outlined in Section 12.5 would reduce the potential for disruption and any residual disruption would be dealt with through compensation agreements which lie outside of the scope of the EIA process. On the basis of these measures and compensation agreements being implemented and subject to further design detail being made available and confirmation of the extent of the reduction in the operational capacity of farm businesses and loss of income, the Inspectorate agrees to scope this matter out from further assessment.	Noted. The appropriate mitigation measures will be detailed in the Code of Construction Practice (CoCP) which will be submitted with the application for development consent. A draft outline CoCP has been provided at **Appendix 4.1 Draft Outline CoCP**. The extent of agricultural land permanently required will be detailed in the ES. Engagement with landowners is ongoing and agreements will be in place prior to construction commencing.
3.7.3	**EMF effects – Operation** The Applicant proposes to scope this matter out on the basis that the National Policy Statement for Electricity Networks Infrastructure (EN5) states that there is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs has any agriculturally significant consequences. Table 12.1 details that where indirect effects to sensitive land uses (such as riding manèges) are identified, additional conductor clearances will be applied. Considering the lack of evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs has any agriculturally significant consequences, and given the measures proposed within Table 12.1, the Inspectorate agrees that this matter can be scoped out from further assessment.	Noted. Should any sensitive land uses be identified, additional conductor clearances will be applied where practicable.

ID	Inspectorate's comments	Response
3.7.4	**Temporary acquisition of land to accommodate maintenance activities associated with the operational phase** The Applicant proposes to scope these matters out on the basis that there is potential for only small areas of BMV land to be temporarily affected and that the measures outlined in Section 12.5 would reduce the potential for temporary disruption, and any residual disruption to loss of income from farm businesses would be dealt with through compensation agreements which lie outside of the scope of the EIA process. In the absence of further detail relating to the location and frequency of maintenance activities associated with the operational phase, the Inspectorate does not at this time agree to scope these matters out from further assessment. The ES should provide an assessment of these matters where there is potential for likely significant effects to occur. The Inspectorate draws the Applicant's attention to ID 2.1.11 of this Opinion.	Whilst there will standard maintenance activities, emergency works will be an unknown in terms of location, scale and frequency. Detail of likely routine and emergency maintenance activities will be included in the ES with cross reference to standard approaches (as already set out in terms of industry good practice) which would be employed to minimise potential impacts.
3.7.5	**Temporary soil disturbance from maintenance activities associated with the operational phase** The Applicant proposes to scope these matters out on the basis that the measures outlined in Section 12.5 would minimise the risk of damage to soil health and function which prevents short-term damage and subsequent long-term damage. On the basis of the control and management measures listed in Section 12.5 being implemented, the Inspectorate agrees that significant effects are unlikely to occur and agrees to scope this matter out from further assessment. The Inspectorate draws the Applicants attention to ID 2.1.11 of this Opinion.	Noted. Whilst there will standard maintenance activities, emergency works will be an unknown in terms of location, scale and frequency. Detail of likely routine and emergency maintenance activities will be included in the ES with cross reference to standard approaches (as already set out in terms of industry good practice) which would be employed to minimise potential impacts. The comments on maintenance / operation will be picked up in line with the project response to ID 2.1.11. in **Chapter 4 Description of the Project**

ID	Inspectorate's comments	Response
3.7.6	**Baseline** The Inspectorate welcomes the proposed detailed ALC surveys of relevant areas. The ES should clearly set out what constitutes a relevant area for surveying and effort should be made to agree the detailed ALC survey locations with the relevant consultation bodies. The Applicant's attention is drawn to Natural England's response (Appendix 2 of this Opinion) in this regard.	An ALC survey plan and methodology is being developed. The survey approach will follow published guidelines with areas to be surveyed assessed at a minimum density of 1 auger per hectare (as required by the published guidance). The survey plan will be shared with Natural England with a clear rationale presented for any areas not proposed to be surveyed. Reference to the Natural England response is noted. The advice/recommendations given by Natural England will be followed.

Project Engagement and Consultation

13.3.3 National Grid has held several meetings with relevant consultees including Natural England and relevant local planning authorities. Correspondence from these discussions will be detailed in the ES.

13.4 Assessment Approach and Methods

13.4.1 **Chapter 5 Approach to Preparing the PEIR** sets out the overarching approach which has been used in developing the preliminary environmental information. This section describes the technical methods used to determine the baseline conditions, sensitivity of receptors and magnitude of impacts and sets out the criteria that have been used for the preliminary agriculture and soils assessment. This section also identifies further assessment needed to be undertaken and reported in the ES.

Guidance Specific to the Agriculture and Soils Assessment

13.4.2 Relevant guidance specific to agriculture and soils that has informed the approach to the preliminary assessment in this PEIR, and which will inform the assessment reported within the ES, comprises:

- Safeguarding our Soils: A Strategy for England (Ref f 13.13);
- Technical Information Note 049. Agricultural Land Classification. Protecting the Best and Most Versatile Agricultural Land (Ref 13.14);
- Guide to Assessing Development Proposals on Agricultural Land (Ref 13.15);

- Guidance Note: Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction) (Ref 13.16);
- British Standard Specification for Topsoil and Requirements for Use (Ref 13.17);
- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 13.18)
- Good Practice Guide for Handling Soils in Mineral Workings (Ref 13.19);
- Agricultural Land Classification of England and Wales. Revised Guidelines and Criteria for Grading the Quality of Agricultural Land (Ref 13.20);
- A New Perspective on Land and Soil in Environmental Impact Assessment (Ref 13.21); and
- Design Manual for Roads and Bridges (DMRB) LA 109: Geology and Soils (Ref 13.22).

Study Area

13.4.3 The Scoping Report (Ref 13.11) proposed that the study area for the ES would comprise the area within which agriculture and soil resources may experience effects as a result of the Project.

13.4.4 For the purpose of this assessment, the study area has been defined as the draft Order Limits. A 'wider study area' is also considered, which extends to 1 km around the draft Order Limits to provide environmental context and identify potential receptors (where the extent of a farm business located within the draft Order Limits also extends beyond them). This is considered an appropriate study area based on professional judgment and knowledge of similar projects.

13.4.5 The study area for Agriculture and Soils is presented in **Figure 13.1 Agriculture and soils Study area**. This is presented for the Project inclusive of both the Proposed Overhead Line and Proposed Substation Works.

Baseline Data Gathering and Forecasting Methods

Data sources

13.4.6 The baseline information has been informed by a desk study which has drawn on the following information sources:

- British Geological Survey (BGS) Online Mapping for Bedrock and Superficial Geology (Ref 13.23);
- OS mapping and aerial photography, to establish land use and settlement patterns;
- Ordnance Survey (OS) 1:10,000, 1:25,000, 1:50,000 and 1:250,000 base mapping;
- Soilscapes mapping (showing the distribution of main soil types) was assessed on the Land Information System website (Ref 13.24);
- ALC mapping, including provisional and (where available) detailed ALC mapping (developed from surveys) from the MAGIC website (Ref 13.25); and
- Extent of agri-environmental, and woodland and forestry schemes from the MAGIC website (Ref 13.25).

Further data to be collected to inform the ES

13.4.7 The Agriculture and Soils ES chapter will include baseline data gathered from other assessment chapters where relevant. This will include data from:

- **Chapter 8 Ecology and Biodiversity**;
- **Chapter 11 Water Environment**;
- **Chapter 12 Geology and Hydrogeology**; and
- **Chapter 17 Socioeconomics, Recreation and Tourism**.

13.4.8 In addition to the data collected for this preliminary assessment, the assessment reported in the ES will be informed by the following additional third-party data and data obtained through surveys:

- Detailed ALC surveys – these will commence in Autumn/Winter 2024 and will be undertaken in accordance with the published ALC guidelines (Ref 13.20).
  - Soil and ALC surveys will be undertaken within the draft Order Limits (not including the 1 km wider study area), with additional auger points located where the draft Order Limits are wider to accommodate, for example, compounds.
- Climatic data and Land Information System Soil Site Reports.

Assessment Methods and Criteria

13.4.9 This section sets out the proposed methodology for the soils and agriculture assessment of the ES. The assessment will be based on guidance set out by IEMA on how land and soil should be assessed in EIA (Ref 13.21).

13.4.10 The IEMA guidance advocates an approach to assessing the soil functions, ecosystem services and the natural capital provided by land and soils.

Sensitivity

13.4.11 The criteria used to determine the value and sensitivity of receptors specific to agriculture and soils are set out in Table 13.2, Table 13.3 and Table 13.4, as set out in the IEMA guidance (Ref 13.21) and DMRB (Ref 13.22).

Table 13.2 - Sensitivity criteria for soil resource and function

Receptor sensitivity	Soil resource and soil functions
Very High	**Biomass production**: ALC Grades 1 and 2. **Ecological habitat, soil biodiversity and platform for landscape**: soils supporting protected features within a European site (e.g., Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar); peat soils; soils supporting a National Park, or ancient woodland. **Soil carbon**: peat soils; soils with potential for ecological/landscape restoration. **Soil hydrology**: very important catchment pathway for water flows and flood risk management.

Receptor sensitivity	Soil resource and soil functions
	Archaeology, cultural heritage, community benefits and geodiversity: scheduled monuments and adjacent areas; World Heritage and European designated sites; soils with known archaeological interest; soils supporting community/recreational/educational access to land covered by National Park designation. **Source of materials**: important surface mineral reserves that would be sterilised (i.e. without future access).
High	**Biomass production**: ALC Grade 3a. **Ecological habitat, soil biodiversity and platform for landscape**: soils supporting protected features within a UK designated site (e.g., United Nations Educational, Scientific and Cultural Organization (UNESCO) Geoparks, Site of Special Scientific Interest (SSSI) or National Landscapes (NL), Special Landscape Area (SLA) and Geological Conservation Review sites); native forest and woodland soils; unaltered soils supporting semi-natural vegetation. **Soil carbon**: organo-mineral soils (e.g., peaty soils). **Soil hydrology**: important catchment pathway for water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: soils with probable (e.g., where an archaeological site is likely to exist based on previous research/assessment) but as yet unproven (prior to being revealed by construction) archaeological interest; historic parks and gardens; Regionally Important Geological Site (RIGS); soils supporting community/recreational/educational access to RIGS and National Landscapes[2]. **Source of materials**: surface mineral reserves that would be sterilised (i.e., without future access).
Medium	**Biomass production**: ALC Grade 3b. **Ecological habitat, soil biodiversity and platform for landscape**: soils supporting protected or valued features within non-statutory designated sites (e.g., Local Nature Reserves (LNR), Local Geological Sites (LGSs), Sites of Nature Conservation Importance (SNCIs), SLA; non-native forest and woodland soils. **Soil carbon**: mineral soils with elevated soil carbon resulting from land management practices such as addition of organic amendments or minimisation of soil disturbance (for example under long-term pasture). **Soil hydrology**: important minor catchment pathway for water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: soils with possible (e.g., where professional judgement suggests an archaeological site may exist based on soil type, aspect, adjacent features etc.) but as yet unproven (prior to being revealed by

[2] The IEMA guidance refers to Areas of Outstanding Natural Beauty. The text here has been updated to reflect their renaming to National Landscapes (effective from 22 November 2023).

Receptor sensitivity	Soil resource and soil functions
	construction) archaeological interest; soils supporting community/recreational/educational access to land. **Source of materials**: surface mineral reserves that would remain accessible for extraction.
Low	**Biomass production**: ALC Grade 4 and 5. **Ecological habitat, soil biodiversity and platform for landscape**: soils supporting valued features within non-designated notable or priority habitats/landscapes. Agricultural soils. **Soil carbon**: mineral soils. **Soil hydrology**: pathway for local water flows and flood risk management. **Archaeology, cultural heritage, community benefits and geodiversity**: soils supporting no notable cultural heritage, geodiversity nor community benefits; soils supporting limited community/recreational/educational access to land. **Source of materials**: surface mineral reserves that would remain accessible for extraction.
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions.

Table 13.3 - Guidance on the sensitivity of soils in relation to handling/disturbance

Sensitivity	Definition
High Sensitivity (low resilience to structural damage)	Soils with high clay and silt fractions (clays, silty clays, sandy clays, heavy silty clay loams and heavy clay loams) and organo-mineral and peaty soils where the Field Capacity Days (FCD) are 150 or greater; Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where the FCDs are 225 or greater; and All soils in wetness class (WC) WCV or WCVI.
Medium Sensitivity (medium resilience to structural damage)	Clays, silty clays, sandy clays, heavy silty clay loams, heavy clay loams, silty loams and organo-mineral and peaty soils where the FCDs are fewer than 150; Medium-textured soils (silt loams, medium silty clay loams, medium clay loams and sandy clay loams) where FCDs are fewer than 225; and Sands, loamy sands, sandy loams and sandy silt loams where the FCDs are 225 or greater or are in wetness classes WCIII and WCIV.

Sensitivity	Definition
Low sensitivity (high resilience to structural damage)	Soils with a high sand fraction (sands, loamy sands, sandy loams and sandy silt loams) where the FCDs are fewer than 225 and are in wetness classes WCI to WCII.

Table 13.4 - Sensitivity Criteria for agricultural landholdings

Sensitivity	Definition
Very High	**Agricultural land holdings**: 1) Areas of land in which the enterprise is wholly reliant on the spatial relationship of land to key agricultural infrastructure; and 2) Access between land and key agricultural infrastructure is required on a frequent basis (daily).
High	**Agricultural land holdings**: 1) Areas of land in which the enterprise is dependent on the spatial relationship of land to key agricultural infrastructure; and 2) Access between land and key agricultural infrastructure is required on a frequent basis (weekly).
Medium	**Agricultural land holdings**: 1) Areas of land in which the enterprise is partially dependent on the spatial relationship of land to key agricultural infrastructure; and 2) Access between land and key agricultural infrastructure is required on a reasonably frequent basis (monthly).
Low	**Agricultural land holdings**: 1) Areas of land which the enterprise is not dependent on the spatial relationship of land to key agricultural infrastructure; and 2) Access between land and key agricultural infrastructure is required on an infrequent basis (monthly or less frequent).
Negligible	**Agricultural land holdings**: 1) Areas of land which are infrequently used on a non-commercial basis.

Magnitude

13.4.12 The criteria used to determine the magnitude of impact on soil resources, soil function and agricultural land are presented in Table 13.5 and Table 13.6 (as set out in the IEMA guidance (Ref 13.21) and the DMRB (Ref 13.22)).

Table 13.5 - Magnitude of impact criteria for soil resource and soil function

Magnitude of impact (change)	Description of impacts restricting proposed land use
Large	Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20 hectares (ha) or loss of soil-related features set out in Table 13.2 (including effects from 'temporary developments'). or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20 ha or gain in soil-related features set out in **Table 13.2**, as advised by other topic specialists (including effects from 'temporary developments').
Medium	Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20 ha or loss of soil-related features set out in **Table 13.2**, as advised by other topic specialists (including effects from 'temporary developments'). or Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20 ha or gain in soil-related features set out in **Table 13.2**, as advised by other topic specialists.
Small	Permanent, irreversible loss over less than 5 ha or a temporary, reversible loss of one or more soil functions or soil volumes), or temporary, reversible loss of soil-related features set out in **Table 13.2**, as advised by other topic specialists. or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5 ha or a temporary improvement in one or more soil functions due to remediation or restoration or off-site improvement, or temporary gain in soil-related features set out in **Table 13.2**, as advised by other topic specialists.
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.

Table 13.6 - Magnitude criteria for impacts on agricultural land

Magnitude of impact	Description of impacts
High	**Private property and housing, community land and assets, development land and businesses and agricultural land holdings**: 1) Loss of resource and/or quality and integrity of resource; Severe damage to key characteristics, features or elements, e.g., direct acquisition and demolition of buildings and direct development of land to accommodate highway assets; and/or 2) Introduction (adverse) or removal (beneficial) of complete severance with no/ full accessibility provision.
Medium	**Private property and housing, community land and assets, development land and businesses and agricultural land holdings**: 1) Partial loss of/damage to key characteristics, features or elements, e.g., partial removal or substantial amendment to access or acquisition of land compromising viability of property, businesses, community assets or agricultural holdings; and/or 2) Introduction (adverse) or removal (beneficial) of severe severance with limited/moderate accessibility provision.
Low	**Private property and housing, community land and assets, development land and businesses and agricultural land holdings**: 1) A discernible change in attributes, quality or vulnerability; minor loss of, or alteration to, one (maybe more) key characteristics, features or elements, e.g., amendment to access or acquisition of land resulting in changes to operating conditions that do not compromise overall viability of property, businesses, community assets or agricultural holdings; and/or 2) Introduction (adverse) or removal (beneficial) of severance with adequate accessibility provision.
Negligible	**Private property and housing, community land and assets, development land and businesses and agricultural land holdings**: 1) Very minor loss or detrimental alteration to one or more characteristics, features or elements, e.g., acquisition of non-operational land or buildings not directly affecting the viability of property, businesses, community assets or agricultural holdings; and/or 2) Very minor introduction (adverse) or removal (beneficial) of severance with ample accessibility provision.
No Change	No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

Significance of effects

13.4.13 The significance of an effect is then derived using the methodology set out in **Chapter 5 Approach to Preparing the PEIR**. An effect determined to be moderate or above would be deemed significant.

Approach to defining significance in the PEIR

13.4.14 As set out in **Chapter 5 Approach to Preparing the PEIR** the 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.

13.4.15 Following on from the identification of whether an effect is considered likely to be significant or not significant, a confidence in the prediction is given a rating of high, moderate or low in line with the confidence level definitions presented in **Chapter 5 Approach to Preparing the PEIR**.

Preliminary Assessment Assumptions and Limitations

13.4.16 The assessment has been undertaken based on preliminary design information for the Proposed Overhead Line presented in in **Chapter 4 Description of the Project**. This information is iterative and will be updated and reported in the ES as the design evolves and relevant changes are accounted for in the assessment.

13.4.17 For the preliminary assessment, it is assumed that all areas temporarily disturbed during construction would be reinstated and the existing land use resumed. Permanent land take relates to the pylon bases, environmental mitigation areas and Biodiversity Net Gain (BNG) areas.

Further Assessment within the ES

13.4.18 The ES will present a detailed assessment in accordance with IEMA guidance (Ref 13.21) with the significance of the effect on a receptor presented during construction and operation (and maintenance) (where relevant), when considered in relation to the sensitivity or value of the receptor and the magnitude of the potential impact.

13.4.19 All areas will be reassessed based on the design presented in the DCO application when further details are available about the proposals and extent of land use change.

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

13.4.21 The value/sensitivity of receptors will be informed by the soil and ALC surveys undertaken and further landholdings information, which will classify agricultural land affected by the Project and provide details of the characteristics of the soils and the nature of the functions they provide.

13.4.22 Professional judgement will also be used when allocating significance. This is of relevance where the assessment is based on a qualitative approach and the significance of effect is a matter of judgement rather than a quantified outcome. Explanatory text will be provided to explain how professional judgement, where used,

has determined the significance value. Where the matrix (see **Chapter 5 Approach to Preparing the PEIR**) indicates two or more levels of significance are possible, professional judgement will be applied to determine the level of significance.

13.4.23 The assessment of significance will include the reasoned argument setting out the rationale for the sensitivity, magnitude and significance of effect.

13.4.24 The ES will provide final details of embedded, control and management measures, and additional mitigation measures which will be informed by the findings of the assessment and the outcomes of statutory consultation.

13.5 Baseline Conditions

13.5.1 This section describes agriculture and soils baseline in the study area where it relates to the Proposed Overhead Line. The baseline in the study area for agriculture and soils where it relates to the Proposed Substation Works is presented in **Chapter 20 Substations and Associated Works**.

13.5.2 Baseline conditions have been gathered from desk-based information and are presented with reference to the section of the Project that they are located (as shown on **Figure 1.1 Project Location and Route Sections** in Volume 2). For more information on the section of the Project please read **Chapter 4 Description of the Project**.

Study Area Overview

Geology

13.5.3 The solid geology underlying the northern section of the study area, to the west of Hull and north of the Humber estuary, is described as predominately comprising Burnham Chalk Formation, sedimentary bedrock formed between 93.9 and 83.6 million years ago during the Cretaceous period. As the route turns to the south, much of the remaining route is described as underlain with Mercia Mudstone Group, sedimentary bedrock formed between 252.2 and 201.3 million years ago during the Triassic period.

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

13.5.5 Further descriptions of the underlying geology within each route section are given in the baseline sections below.

Soils

13.5.6 The soil types which have formed in this geology vary across the study area, as shown in **Figure 13.6 Soilscapes**. The predominant soil types are identified as loamy and clayey soils of coastal flats with naturally high groundwater in the areas surrounding the River Humber. The soil types across the rest of the study area are primarily described as slightly acidic loamy and clayey soils with impeded drainage.

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

13.5.8 The Soil Associations (representing a group of soil series (soil types) which are typically found occurring together in the landscape) have been identified within the study area (Ref 13.27) as follows:

- Aberford: Shallow, locally brashy, well drained calcareous fine loamy soils over limestone. Parent material: Permian, Jurassic, and Eocene limestone.
- Andover 1: Shallow well drained calcareous silty soils over chalk on slopes and crests. Deep calcareous and non-calcareous fine silty soils in valley bottoms. Striped soil patterns locally. Parent material: chalk.
- Blackwood: Deep permeable sandy and coarse loamy soils. Parent material: Glaciofluvial drift.
- Blocktoft: Deep stoneless permeable calcareous fine and course silty soils. Some calcareous clayey soils. Groundwater controlled by ditches and pumps. Flat land. Parent material: marine alluvium.
- Brockhurst 2: Slowly permeable seasonally waterlogged reddish fine loamy over clayey and clayey soils. Some reddish clayey alluvial soils affected by groundwater. Parent material: Permo-Triassic reddish mudstone and alluvium.
- Burlingham 2: Deep fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some slowly permeable seasonally waterlogged fine loamy soils. Some well drained fine and coarse loamy soils. Parent material: chalky till.
- Compton: Seasonally wet deep stoneless mostly reddish clayey soils affected by groundwater. Parent material: Reddish river alluvium.
- Downholland 2: Deep, stoneless clayey or calcareous silty soils, mainly with a humose surface horizon. Parent material: Marine alluvium.
- Dunnington Heath: Reddish coarse and fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Parent materials: Drift over permo-triassic reddish mudstone.
- Foggathorpe 2: Slowly permeable seasonally waterlogged stoneless clayey and fine loamy over clayey soils. Parent material: Glaciolacustrine clay.
- Holderness: Slowly permeable seasonally waterlogged fine loamy soils and similar soils with only slight waterlogging. Some narrow strips of clayey alluvial soils. Parent material: chalky till.
- Hunstanton: Deep well drained often reddish fine loamy and course loamy soils. Some similar calcareous soils over chalk. Parent material: Till and glaciofluvial drift over chalk.
- Isleham 2: Deep permeable sandy and peaty soils affected by groundwater. Parent materials: Glaciofluvial drift and peat.
- Landbeach: Permeable calcareous coarse loamy soils affected by groundwater over chalky gravel. Parent material: Glaciofluvial sand and gravel.
- Newchurch 2: Deep stoneless mainly calcareous clayey soils. Groundwater controlled by ditches and pumps. Flat land. Risk of flooding in places. Parent material: marine alluvium.
- Newport 1: Deep well drained sandy and coarse loamy soils. Parent material: Glaciofluvial drift.

- Panholes: Well drained calcareous fine silty soils over chalk. Associated similar shallow soils and deeper non-calcareous fine silty soils. Parent material: chalk.
- Romney: Deep stoneless permeable calcareous course and fine silty soils. Flat land. Groundwater controlled by ditches and pumps. Parent material: marine alluvium.
- Whimple 3: Reddish fine loamy or fine silty over clayey soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar clayey soils on brows. Slowly permeable seasonally waterlogged fine loamy and fine silty over clayey soils on lower slopes. Parent material: Drift over Permo-Triassic and Carboniferous reddish mudstone.
- Willingham: Extremely calcareous silty and clayey soils, in places humose, and often over peat. Parent material: Lake marl tufa and peat.
- Worcester: Slowly permeable non-calcareous and calcareous reddish clayey soils over mudstone, shallow on steeper slopes. Associated with similar noncalcareous fine loamy over clayey soils. Slight risk of water erosion. Parent material: Permo-Triassic reddish mudstone.

13.5.9 The distribution of the primary soil associations mapped across the Route Sections of the draft Order Limits are detailed in Table 13.7.

Table 13.7 - Distribution of mapped soil associations across the Route Sections within the draft Order Limits

	Route Section										
	1	2	3	4	5	6	7	8	9	10	11
Holderness	X										
Burlingham 2	X										
Hunstanton	X	X									
Panholes		X									
Andover 1		X									
Landbeach		X	X								
Aberford			X								
Newchurch 2			X								
Foggathorpe 2			X								
Blacktoft			X	X	X						
Romney					X	X	X	X			
Blackwood						X	X	X			
Brockhurst 2						X	X	X	X	X	
Newport 1							X				

	Route Section				
Worcester	X		X	X	
Whimple 3		X		X	X
Willingham		X			
Compton				X	

Agricultural Land Classification

13.5.10 Provisional ALC mapping, presented on **Figure 13.2 Provisional ALC Mapping**, shows that the study area comprises extensive areas of Grade 2 land, as well as some Grade 1 land within the draft Order Limits between Sections 1 and 8 (from Crekye Beck to Chesterfield Canal). South of the Chesterfield Canal (Sections 9, 10, and 11) the land is predominately mapped as Grade 3 land.

13.5.11 The mapping, at a scale of 1:250,000, does not distinguish between Grades 3a (BMV) and 3b (not BMV), and therefore cannot be used to inform site specific assessments, but instead provides an indication of the most likely land classification. The provisional ALC information available suggests that a large portion of the draft Order Limits may comprise BMV land.

13.5.12 Small areas of detailed ALC mapping are available for areas of agricultural land within the study area (**Figure 13.3 Detailed ALC Mapping**). Outside the northern end of the draft Order Limits there are areas of Grades 2, 3a and 3b BMV land mapped from surveys conducted at Spring Park Golf Course, Cottingham in 1989. Small sections of Grades 2, 3a and 3b are also recorded near Gilberdyke as surveys conducted in 1992.

13.5.13 Further south in the study area (but outside the draft Order Limits), near Crowle, surveys conducted between 1992-1995 identified and mapped further areas of Grades 2, 3a and 3b. This information indicates the presence of BMV land in the landscape surrounding the draft Order Limits and thus the likelihood that BMV land will be present within the draft Order Limits.

13.5.14 This is supported by information on the relative extent of Grades 1, 2 and 3 land within the wider landscape. Table 13.8 shows that there is an above average representation of Provisionally graded BMV land within the region.

Table 13.8 - Provisionally mapped Best and Most Versatile land across the Project counties

Area	Route Section(s)	Extent of Grades 1, 2 and 3 land (ha) within area	Proportion (%) of Grades 1, 2 and 3 within area
England	-	8,493,646	65.1
East Riding of Yorkshire	1, 2, 3, 4, 5	220,514	91.5
North Lincolnshire	5, 6, 7	76,663	90.3
Nottinghamshire	8, 9, 10, 11	172,100	82.5

13.5.15 Based on the Provisional ALC mapping, the extent of each land grade present within the draft Order Limits is as shown in Table 13.9. Further granularity of the Provisional grade proportions present within specific route sections are detailed below in the following sections.

Table 13.9 - Route wide Provisional ALC Grade distribution

ALC grade	Area (ha)	%
Grade 1	62.42	3.79
Grade 2	878.48	53.29
Grade 3	700.37	42.49
Potential BMV	*1,641.27*	*99.56*
Grade 4	2.53	0.15
Grade 5	0.00	0.00
Total Agricultural	*1,643.80*	*99.72*
Other	4.65	0.28
Total	**1,648.45**	**100.00**

13.5.16 Due to the scale of the Project, information presented in the profiles of the National Character Areas (NCA) provides an indication of the extent of each ALC grade (Ref 13.28 – Ref 13.32), which can be compared to the extent of each grade at national level. Nationally, 65.1 percent of land in England (Ref 13.27) is Provisionally graded as Grades 1, 2, and 3 (and therefore likely to comprise BMV land), as laid out in Table 13.8.

13.5.17 The Project extends through five NCAs (NCA 27, NCA 39, NCA, 40, NCA 41, and NCA 48 – from Holderness through to the Trent and Belvoir Vales). Table 13.10 indicates an above average proportion of Provisionally graded BMV land within the draft Order Limits and surrounding landscape.

Table 13.10 - Provisional Agricultural Land Classification Grades by area (ha) for the NCA profiles across the Project

ALC Grade	NCA 27: Yorkshire Wolds [Area (%)]	NCA 39: Humberhead Levels [Area (%)]	NCA 40: Holderness [Area (%)]	NCA 41: Humber Estuary [Area (%)]	NCA 48: Trent and Belvoir Vales [Area (%)]	England [Area (%)]
Grade 1	0 (0%)	16,736 (10%)	0 (0%)	352 (1%)	180 (<1%)	354,562 (2.7%)

ALC Grade	NCA 27: Yorkshire Wolds [Area (%)]	NCA 39: Humberhead Levels [Area (%)]	NCA 40: Holderness [Area (%)]	NCA 41: Humber Estuary [Area (%)]	NCA 48: Trent and Belvoir Vales [Area (%)]	England [Area (%)]
Grade 2	54,627 (49%)	55,874 (33%)	36,547 (42%)	10,102 (36%)	24,116 (14%)	1,848,874 (14.2%)
Grade 3	47,903 (43%)	71,260 (41%)	43,985 (50%)	8,395 (30%)	139,310 (78%)	6,290,210 (48.2%)
Potential BMV	*102,530 (92%)*	*143,870 (84%)*	*80,532 (92%)*	*18,849 (67%)*	*163,606 (92%)*	*8,493,646 (65.1%)*
Grade 4	6,776 (6%)	14,764 (9%)	1,661 (2%)	347 (1%)	2,771 (2%)	1,839,581 (14.1%)
Grade 5	459 (<1%)	3,405 (2%)	0 (0%)	0 (0%)	0 (0%)	1,100,305 (8.4%)
Non-agricultural	735 (<1%)	4,165 (2%)	1,087 (1.3%)	282 (<1%)	3,874 (2%)	655,856 (5%)
Urban	856 (<1%)	5,415 (3%)	3,898 (4.5%)	7,988 (28%)	7,354 (4%)	951,424 (7.3%)

13.5.18 This information shows that in the regions that the draft Order Limits pass through there is generally a greater proportion of higher-grade agricultural land than compared to the average for England. Whilst the Provisional ALC mapping does not distinguish between Grades 3a and 3b, and this does not correlate directly with the proportion of BMV present, it provides an indication that these areas are likely to comprise a greater extent of BMV land than compared to the average for England.

Land use

13.5.19 A desk-based assessment using detailed aerial photography and Ordnance Survey Mapping has shown that the land use across the draft Order Limits appears to be a combination of arable and pastureland. The draft Order Limits also pass close by areas of urban infrastructure including large cities such as Hull.

13.5.20 Across the study area there are various areas of land under Countryside Stewardship Agreements (Middle and Higher Tier), as well as areas designated under various Environmental Stewardship Agreement Levels as shown in **Figure 13.4 Agri-environmental Schemes**. There are also parcels of land within the draft Order Limits which are also under Woodland Grant Schemes, as illustrated in **Figure 13.5 Forestry and Woodland Grant Schemes**.

Future Baseline

13.5.21 Predicting future baseline requires projecting forward any trends in change and considering how they may affect the baseline conditions over time. The nature of future baseline is influenced by a combination of natural and human processes, including climate change.

13.5.22 As detailed in **Chapter 5 Approach to Preparing the PEIR**, a review has been undertaken to determine whether the existing baseline conditions might change between the time of undertaking the assessment and the future years in which the Project is planned to be constructed and become operational.

13.5.23 Consideration was given to the loss of agricultural land, with particular attention to the loss of BMV agricultural land and potential changes to ALC grades. It is considered that the baseline in relation to soils and ALC grades would not change from what is described in the baseline within the timeframe for the construction of the Project. The Met Office's UK Climate Projects (UKCP18) (Ref 13.33) predict that the future climate would consist of warmer winters with more intense rainfall events. However, the overall annual rainfall is expected to remain consistent with current levels as there is expected to be a change to a larger volume in winter and lower volume in summer. The increased intensity of rainfall events would increase risk of soil erosion and runoff, risking reducing topsoil thickness and thus land quality if not properly mitigated.

13.5.24 The global annual temperature is predicted to increase by 2°C. this increase in global temperatures would increase soil surface cracking but also increase total field capacity days. However, these changes are predicted to be of a slight to negligible magnitude.

13.5.25 There could potentially be future changes to land management practices and business approaches across the landowners/land mangers irrespective of whether the Project goes ahead; these cannot be known or assessed currently. Any future proposed changes will be accounted for in the ES.

13.5.26 Therefore, the overall future baseline for soils and land use would likely be comparable to the current baseline conditions. Whilst climate change may result in impacts such as greater rainfall intensity and frequency of droughts which could affect soil conditions, land grade and farming practices, it is likely that these would only be visible over longer timeframes.

13.5.27 The review included an evaluation of the committed developments identified in **Chapter 21 Cumulative Effects**. This involved:

a) The identification of any consented developments within the assessment study area that have yet to be implemented.

b) Analysis of the likely environmental effects and planned timescales for each identified development project.

c) An assessment of the potential for each identified development project to change the baseline in the construction year (2028) and opening year (2031) of the Project, in the manner described above.

13.5.28 Accordingly, the assessment does not consider future baseline conditions further. Future baseline developments are identified in **Chapter 21 Cumulative Effects**, at section 21.6.

13.6 Mitigation

13.6.1 As set out in **Chapter 5 Approach to Preparing the PEIR** mitigation measures fall into one of three categories: embedded measures; control and management measures; and additional mitigation measures. Those measures relevant to the assessment of agriculture and soils effects are set out below.

Embedded Mitigation Measures

13.6.2 Environmental appraisal has been an integral part of the Project design from the outset, which has meant that the Project has been able to avoid environmentally sensitive features as far as reasonably practicable.

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

13.6.4 Embedded measures are those that are intrinsic to and built into the design of the Project, which have been presented in Table 4.2 in **Chapter 4 Description of the Project**. Embedded measures of relevance to the agriculture and soils chapter include:

- Sensitive routeing and siting to develop the draft overhead line alignment, siting of substations and draft Order Limits. Avoids and reduces, as far as practicable, impacts on identified receptors, in line with the National Policy Statements EN-1 (Ref 13.2 and EN-5 (Ref 13.3 as well as the Holford Rules (Ref 13.35) and the Horlock Rules (Ref 13.36). Further information on options appraisal and the alternative options considered is set out in **Chapter 3 Project Need and Alternatives**.

Control and Management Measures

13.6.5 Control and management measures, comprising management activities and techniques, will be implemented during construction of the Project to limit effects through adherence to good site practices and achieving legal compliance.

13.6.6 An Outline Code of Construction Practice (CoCP) is provided in **Appendix 4.1 Draft Outline CoCP** in Volume 3. Measures contained within the Outline CoCP that are relevant to the control and management of impacts that could affect the agriculture and soils receptors are:

- GG01: The Project will be run in compliance with all relevant legislation, consents and permits including the limitations and requirements set out in the DCO.
- GG02: The Project design will be compliant with the guidelines and policies relating to electric and magnetic fields stated in National Policy Statement EN-5 (Ref 13.3 including the International Commission on Non-Ionizing Radiation Protection guidelines (Ref 13.37) (1998).
- GG03: The following environmental management plans will be produced prior to construction.
  - Code of Construction Practice (CoCP);
  - Register of Environmental Actions and Commitments (REAC);
  - Construction Traffic Management Plan (CTMP);
  - Soil Management Plan (SMP);
  - Public Rights of Way Management Plan;
  - Materials and Waste Management Plan (MWMP);
  - Noise and Vibration Management Plan;

  - Landscape and Ecology Management Plan (LEMP) including an Outline; and Landscape Maintenance and Management Plan
  - Archaeological Written Scheme of Investigation (WSI)
- GG04: The CoCP shall include measures to manage dust, waste, water, noise, vibration and soil during construction. The contractor(s) shall undertake site inspections to check conformance to the Management Plans.
- GG05: A suitably experienced Environmental Manager will be appointed for the duration of the construction phase. In addition, a qualified and experienced 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 CoCP. The EnvCoW 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 will be supported as necessary by appropriate technical specialist advisors, including archaeologists, ecologists, soil scientists, and arboriculturists.
- GG07: 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.
- GG19: Earthworks and stockpiled soil will be protected by covering, seeding or using water suppression where appropriate.
- GG24: Where necessary, stone pads 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 measures contained in the CoCP. Other soil stabilisation techniques will be considered where appropriate.
- GG28: The construction work area will be reinstated to pre-existing conditions as far as reasonably practical in line with a SMP and the Department for Environment, Food and Rural Affairs (Defra) 2009 Code of Construction Practice for the Sustainable Use of Soils on Construction Sites (Ref 13.18). This will include a commitment to the development of an Aftercare Management Plan (including the aftercare period) prior to the completion of construction.
- AS01: Soil management measures will be set out in a SMP. Measures within the SMP will include but not be limited to the following:
  - how topsoil and subsoil will be stripped and stockpiled (based on detailed soil survey data);
  - 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; and
  - details of measures required for soil restoration.

- AS02: 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).
- 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.
- AS04: 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.
- AS05: Consultation with affected landowners will be carried out to investigate the current extent of land drainage. 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.
- AS06: 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.
- AS07: All movement of plant and vehicles between fields will cease in the event of a notification by 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.
- AS08: Clay bungs or other vertical barriers will be constructed within trench excavations where deemed necessary by a suitably experienced person, to prevent the creation of preferential drainage pathways.
- AS09: Should peat deposits or peaty soils be identified, impacts to these areas would be avoided, where practicable, in line with the requirements of other disciplines and engineering constraints. A provision for this will also be included in the SMP.

Additional Mitigation Measures

13.6.7 Additional mitigation comprises measures over and above any embedded and control and management mitigation measures, for which assessment within this PEIR has identified a requirement to further reduce significant environmental effects.

13.6.8 The preliminary assessment reported in this PEIR has not identified any requirements for additional mitigation at this stage, over and above the embedded or control and management measures identified. This will continue to be reviewed as the assessment progresses and the preliminary design develops further.

13.7 Preliminary Assessment

13.7.1 This section first identifies the potential effects that could occur as a result of the construction, operation and maintenance of the Proposed Overhead Line. The preliminary assessment is then presented for the Proposed Overhead Line as described in **Chapter 4 Description of the Project.** The preliminary assessment of the Proposed Substation Works is presented in **Chapter 20 Substations and Associated Works.**

13.7.2 The preliminary assessment takes into account the embedded, and control and management measures set out in Section 13.6. This is in accordance with guidance from the IEMA as part of preparing a proportionate assessment (Ref 13.26).

13.7.3 It should be noted that this assessment is ongoing and is subject to change through ongoing development of the Project.

13.7.4 A full detailed assessment will be presented within the ES submitted with the DCO application.

Potential Effects

13.7.5 The potential for the Proposed Overhead Line to result in likely significant effects on agriculture and soils receptors was determined through the EIA scoping process. This section lists those potential effects that have been scoped into the assessment within the EIA Scoping Report (Ref 13.11) taking into account the comments received within the Scoping Opinion (Ref 13.10). Where the scope has been amended since publication of the EIA Scoping Report (Ref 13.11), explanatory text has been included to provide justification for this change.

Construction

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

- Temporary loss of agricultural land resulting in a reduction in the extent of productive agricultural land affecting the associated agricultural business;
- Temporary loss of BMV land; and
- Potential effects on soil function resulting in a reduction in the ability of the soil to function and provide ecosystem services as a result of temporary soil disturbance.

Operation

13.7.7 The potential effects that could result from the operation of the Proposed Overhead are:

- Permanent acquisition of land to accommodate the Proposed Overhead Line, including BMV land and a reduction in the extent of the most productive agricultural land.

Maintenance

13.7.8 Potential effects on soils and agriculture from the maintenance of the Proposed Overhead Line had originally been scoped out in the EIA Scoping Report (Ref 13.11); this has been brought back in to scope based upon comments received within the Scoping Opinion (Ref 13.10).

13.7.9 The potential effects that could result from the operational maintenance of the Proposed Overhead Line are:

- Temporary disruption to landholdings resulting in reduction in the operational capacity of farm businesses and loss of income; and
- Temporary loss of agricultural land (including BMV land) and reduction in the extent of the most productive agricultural land.

Preliminary Construction Effects

Agricultural operations

13.7.10 During construction there would be potential effects on agricultural operations due to disturbance (where livestock are present), fragmentation, access restrictions or disruption to water supplies or land drainage. Commitments set out within the **Appendix 4.1 Draft Outline CoCP** to maintain access throughout construction, would minimise the effects on agricultural landholdings. Potential effects on land drainage and flood risk from all relevant sources during construction and operation are covered in **Chapter 11 Water Environment**.

13.7.11 By the end of construction, land required temporarily would be reinstated and effects on agricultural operations during the construction phase would be dealt with through compensation agreements (which lie outside of the EIA process). It is therefore considered that this would likely result in a non-significant effect on land use. The confidence in this preliminary assessment is high.

BMV land and soils function

13.7.12 During construction there would be a potential loss of BMV land (ALC Grades 1, 2, and 3a) from agricultural productivity. To undertake this preliminary assessment, publicly available Provisional ALC data, and detailed data where available, has been used. As the Provisional ALC mapping does not differentiate between Grade 3a (BMV) and Grade 3b (non-BMV), a worst-case perspective has been taken for the assessment where all land provisionally mapped as Grade 3 has been considered to have the potential to be BMV land.

13.7.13 There would be disturbance to soils, either from access across unstripped land for overhead line installation / removal, or due to the soil stripping required for the underground cable installation as part of third party works, pylon footings, and areas

required temporarily (such as construction compounds, haul roads). There would also be the potential for effects on the ecosystem services the soils provide. Effective mitigation measures are set out within the Outline CoCP and will be further detailed in an OSMP (to be submitted as part of the DCO application) (Appendix 4.1: Draft Outline CoCP is provided in Volume 3) for soil handling, storage and reinstatement which would reduce effects on soils.

13.7.14 From the data available, it is calculated that 1,643.80 ha of agricultural land would be temporarily removed from agricultural production during construction, accounting for 99.72 percent of the total area within the draft Order Limits. Of this, 1,641.27 ha is provisionally mapped as Grades 1, 2 and 3 land (therefore assumed to potentially comprise BMV land) and as such the temporary removal is considered to have a temporary significant effect. The confidence in this preliminary assessment is high. Construction phasing is likely to affect the amount of time land is removed from agricultural production; further details on this will be presented in the ES.

13.7.15 The stripping and stockpiling of soil resources would have a temporary effect on the soil ecosystem services provided. This would include effects to floodplain and peat soils, potentially affecting soil hydrology and soil carbon storage. The implementation of effective soil handling, storage and reinstatement measures would therefore be critical in ensuring minimisation of effects on these functions and their successful restoration. Given the scale of the Proposed Overhead Line and construction activity required it is considered that the effect of the construction phase on soil quality and its associated ecosystem services is assessed as being likely to be significant. The confidence in prediction for this preliminary assessment is high.

13.7.16 All land required (including areas where soils have been disturbed) temporarily would be reinstated by the end of the construction phase.

Preliminary Operational and Maintenance Effects

Agricultural operations

13.7.17 During operation there would be limited effects on agricultural operations. There is the potential for restrictions to existing activities immediately under overhead lines; however, these would be dealt with through compensation agreements (which lie outside of the EIA process). Therefore, no significant effects on agricultural landholdings during operation are anticipated. The confidence in this preliminary assessment is high.

13.7.18 Maintenance activities have the potential to impact agricultural operations. All maintenance works would be undertaken following good practice relevant at the time. Where impacts are identified these would be dealt with through compensation agreements (which lie outside of the EIA process). It is therefore considered that this would result in a non-significant effect on agricultural land and its use. The confidence in this preliminary assessment is high.

BMV land and soils function

13.7.19 During operation there would be a permanent loss of areas of agricultural land for the permanent infrastructure (pylon footings and environmental areas). The land grades and soil types (including peat if present) affected permanently will be confirmed following surveys and will be fully assessed and reported in the ES.

13.7.20 Current designs require approximately 2.73 ha for the new-build pylon footings across the route, with all but one of the pylons being situated in areas also assumed to comprise BMV land. Six new build pylons (4AF144, 4AF176, 4AF178, 4AF181, 4AF182, and 4AF183) would also be located in areas indicatively mapped as potentially having peaty soils present (the actual presence of peat will be confirmed from the soil surveys to be undertaken, and if peat is present specific mitigation measures will be identified in relation to identified potential impacts on this resource). Current designs also show an additional 40.52 ha of provisionally graded BMV land (Provisional Grades 1, 2, and 3) required for environmental mitigation.

13.7.21 As part of the current design highway widening works have been included and account for 49.36 ha of land take across the Proposed Overhead Line. All of this land is currently within areas mapped as comprising BMV agricultural land.

13.7.22 It is therefore considered that the permanent removal of 92.61 ha, of which 99.9 percent is considered likely to comprise BMV land, would have a significant adverse effect in relation to the permanent removal of BMV land from agricultural use. The confidence in prediction for this assessment is moderate.

13.7.23 Any soil materials required to be removed from the pylon footings would be re-used within the draft Order Limits, where practicable. Where land use would be changed to enable environmental mitigation, the soils would not be removed, and there may be potential benefits as a result of such changes in terms of soil health and soil function. This will be assessed further depending on the current land use and proposed land use.

13.7.24 Under the current design it is assumed that all access routes will utilise pre-existing access infrastructure, such as roads and farm tracks. As such no vegetation clearance, soil stripping or access way upgrades have been assessed. As the design evolves any changes will be assessed and presented in the ES.

Summary of the Preliminary Assessment of the Proposed Overhead Line with the Proposed Substation Works

13.7.25 The preliminary assessment of the Proposed Substation Works is presented in **Chapter 20 Substations and Associated Works**.

13.7.26 Shared receptors with the Proposed Substation Works both at Birkhill Wood and High Manham include the potential for loss of BMV, effects on soil function and potential for effects on agricultural operations.

13.7.27 Taking account of the embedded measures set out in **Chapter 4 Description of the Project** and the control and management measures set out in **Appendix 4.1 Draft Outline Code of Construction Practice** any potential effects from the Proposed Substation Works are not likely to be significant, and, when considered together are unlikely to change the preliminary significance presented in this Chapter.

13.8 References

Ref 13.1 Agricultural Land (Removal of Surface Soil) Act 1953, c.10. [Online]. Available at: https://www.legislation.gov.uk/ukpga/Eliz2/1-2/10/contents [Accessed November 2024].

Ref 13.2 Department of Energy and Net Zero (2023). Overarching National Policy Statement for Energy (EN-1). [Online]. Available at: https://assets.publishing.service.gov.uk/media/65bbfbdc709fe1000f637052/overarching-nps-for-energy-en1.pdf [Accessed November 2024]

Ref 13.3 Department of Energy and Net Zero (2023). National Policy Statement for Electricity Networks Infrastructure (EN-5). [Online]. Available at: https://www.gov.uk/government/publications/national-policy-statement-for-electricity-networks-infrastructure-en-5 [Accessed November 2024].

Ref 13.4 Department for Levelling Up, Housing & Communities (2024) National Planning Policy Framework. [Online]. Available at: https://assets.publishing.service.gov.uk/media/675abd214cbda57cacd3476e/NPPF-December-2024.pdf [Accessed November 2024].

Ref 13.5 Department for Environment, Food and Rural Affairs (2023). Environmental Improvement Plan 2023 [Online]. Available at: https://assets.publishing.service.gov.uk/media/64a6d9c1c531eb000c64fffa/environmental-improvement-plan-2023.pdf [Accessed November 2024].

Ref 13.6 East Riding of Yorkshire Council (2016). East Riding Local Plan 2012-2029 Strategy Document. [Online]. Available at: https://downloads.eastriding.org.uk/corporate/pages/east-riding-local-plan/Strategy%20Document%20-%20Adopted%20April%202016%20lo.pdf [Accessed November 2024].

Ref 13.7 North Lincolnshire Council (2011). North Lincolnshire Local Development Framework Core Strategy. [Online]. Available at: https://www.northlincs.gov.uk/planning-and-environment/planning-policy-local-development-framework/#1591178700859-b856fc83-069c [Accessed November 2024].

Ref 13.8 North Lincolnshire Council (2022). North Lincolnshire Local Plan Publication Draft Addendum Plan. [Online]. Available at: https://m.northlincs.gov.uk/public/localplan/examination/Draft%20Local%20Plan%20and%20Supporting%20Information/Publication%20Draft%20Addendum%20May%202022.pdf [Accessed November 2024].

Ref 13.9 Bassetlaw District Council (2024). Bassetlaw Local Plan 2020-2038. [Online]. Available at: https://www.bassetlaw.gov.uk/media/gn1kjm1b/adopted-bassetlaw-local-plan-2020-2038.pdf [Accessed November 2024].

Ref 13.10 The Planning Inspectorate (2023). Scoping Opinion: Proposed North Humber to High Marnham. [Online]. Available at: https://infrastructure.planninginspectorate.gov.uk/wp-content/ipc/uploads/projects/EN020034/EN020034-000009-EN020034%20North%20Humber%20to%20High%20Marnham%20-%20Scoping%20Opinion.pdf [November 2024]

Ref 13.11 National Grid. Scoping Report: North Humber to High Marnham [Online]. Available at: https://national-infrastructure-consenting.planninginspectorate.gov.uk/projects/EN020027/documents?date-from-day=&date-from-month=&date-from-year=&date-to-day=&date-to-month=&date-to-year=&searchTerm=scoping&itemsPerPage=25 [Accessed November 2024]

Ref 13.12 East Riding of Yorkshire Council (2021). Local Plan Update 2020-2039. [Online]. Available at: https://downloads.eastriding.org.uk/corporate/planning/proposed-submission-local-plan-update/PS-LP01%20Strategy%20Document%20Update.pdf [Accessed: November 2024].

Ref 13.13 Department for Food and Rural Affairs (2009). Safeguarding our Soils: A Strategy for England [Online]. Available at: https://assets.publishing.service.gov.uk/media/5a795b71ed915d0422067beb/pb13297-soil-strategy-090910.pdf [Accessed November 2024].

Ref 13.14 Natural England (2012). Technical Information Note 049. ALC: Protecting the Best and Most Versatile Agricultural Land. [Online]. Available at: https://www.gov.uk/government/organisations/natural-england [Accessed November 2024].

Ref 13.15 Natural England (2021). Guide to assessing development proposals on agricultural land [Online]. Available at: https://www.gov.uk/government/publications/agricultural-land-assess-proposals-for-development/guide-to-assessing-development-proposals-on-agricultural-land [Accessed December 2024].

Ref 13.16 British Society of Soil Science (2022) Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction [Online]. Available at: https://soils.org.uk/wp-content/uploads/2022/02/WWS3-Benefitting-from-Soil-Management-in-Development-and-Construction-Jan-2022.pdf [Accessed November 2024].

Ref 13.17 British Standards Institute (2015) BS3882:2015 British Standard Specification for Topsoil and Requirements for Use.

Ref 13.18 Department for Food and Rural Affairs (2009) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites [Online]. Available at: https://assets.publishing.service.gov.uk/media/5b2264ff40f0b634cfb50650/pb13298-code-of-practice-090910.pdf [Accessed: November 2024].

Ref 13.19 Institute of Quarrying (2024). Good Practice Guide for Handling Soils in Mineral Workings [Online]. Available at: https://www.quarrying.org/soils-guidance [Accessed: November 2024]

Ref 13.20 Ministry of Agriculture, Fisheries and Food (1988) Agricultural Land Classification of England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land (ALC011). Available at: https://publications.naturalengland.org.uk/publication/6257050620264448 [Accessed: November 2024]

Ref 13.21 Institute of Environmental Management and Assessment (2022). A new perspective on land and soil in Environmental Impact Assessment [Online]. Available at: IEMA - Launch of New EIA Guidance on Land and Soils - February 2022 [Accessed: November 2024].

Ref 13.22 National Highways (2019). Design Manual for Roads and Bridges (DMRB) LA 109: Geology and Soils.

Ref 13.23 British Geological Survey (2024). BGS Geology Viewer. Available at: BGS Geology Viewer - British Geological Survey [Accessed November 2024].

Ref 13.24 Land Information Service (2024). Soilscapes Viewer. Available at: LandIS - Land Information System - Soilscapes soil types viewer [Accessed November 2024]

Ref 13.25 Department for Food and Rural Affairs (2024). Managed by Natural England and Landmark Solutions. MAGIC [Online]. Available at: MAGIC (defra.gov.uk) [Accessed November 2024].

Ref 13.26 Institute of Environmental Management and Assessment (2022). Delivering Proportionate EIA. Available at: https://www.iema.net/resources/reading-room/2017/07/18/delivering-proportionate-eia [Accessed: November 2024].

Ref 13.27 Soil Survey of England and Wales (1983). Soil Association Data

Ref 13.28 Natural England (2014). NCA Profile: 27 Yorkshire Wolds. Available at: Yorkshire Wolds - National Character Area Profiles (nationalcharacterareas.co.uk) [Accessed: November 2024]

Ref 13.29 Natural England (2014). NCA Profile: 39 Humberhead Levels. Available at: Humberhead Levels - National Character Area Profiles (nationalcharacterareas.co.uk) [Accessed: November 2024]

Ref 13.30 Natural England (2014). NCA Profile 40: Holderness. Available at: Holderness - National Character Area Profiles (nationalcharacterareas.co.uk) [Accessed: November 2024]

Ref 13.31 Natural England (2014). NCA Profile: 41 Humber Estuary. Available at: Humber Estuary - National Character Area Profiles (nationalcharacterareas.co.uk) [Accessed: November 2024]

Ref 13.32 Natural England (2014). NCA Profile: 48 Trent and Belvoir Vales. Available at: Trent and Belvoir Vales - National Character Area Profiles (nationalcharacterareas.co.uk) [Accessed: November 2024]

Ref 13.33 Meteorological Office (1989). Climatological Data for Agricultural Land Classification. London: The Meteorological Office. Available at: Climatalogical Data for Agricultural Land Classification - ALC010 (naturalengland.org.uk) [Accessed November 2024]

Ref 13.34 North Lincolnshire Council (2024). Saved 2003 Local Plan Policies. [Online]. Available at. [Online]. Available at: https://www.northlincs.gov.uk/planning-and-environment/planning-policy-the-north-lincolnshire-local-plan/#1593095254001-ec189f5a-67c8 [Accessed: 13th October 2024].

Ref 13.35 National Grid (2024). National Grid Document Library – Holford Rules. [Online]. Available at: https://www.nationalgrid.com/sites/default/files/documents/13795-The%20Holford%20Rules.pdf [Accessed: December 2024].

Ref 13.36 National Grid (2024). National Grid Document Library – Horlock Rules. [Online]. Available at: https://www.nationalgrid.com/sites/default/files/documents/13796-The%20Horlock%20Rules.pdf [Accessed: December 2024].

Ref 13.37 International commission on non-ionizing radiation protection (1998) [online] Available at; https://www.icnirp.org/cms/upload/publications/ICNIRPemfgdl.pdf [accessed December 2024]

National Grid plc
National Grid House,
Warwick Technology Park,
Gallows Hill, Warwick.
CV34 6DA United Kingdom

Registered in England and Wales
No. 4031152
nationalgrid.com