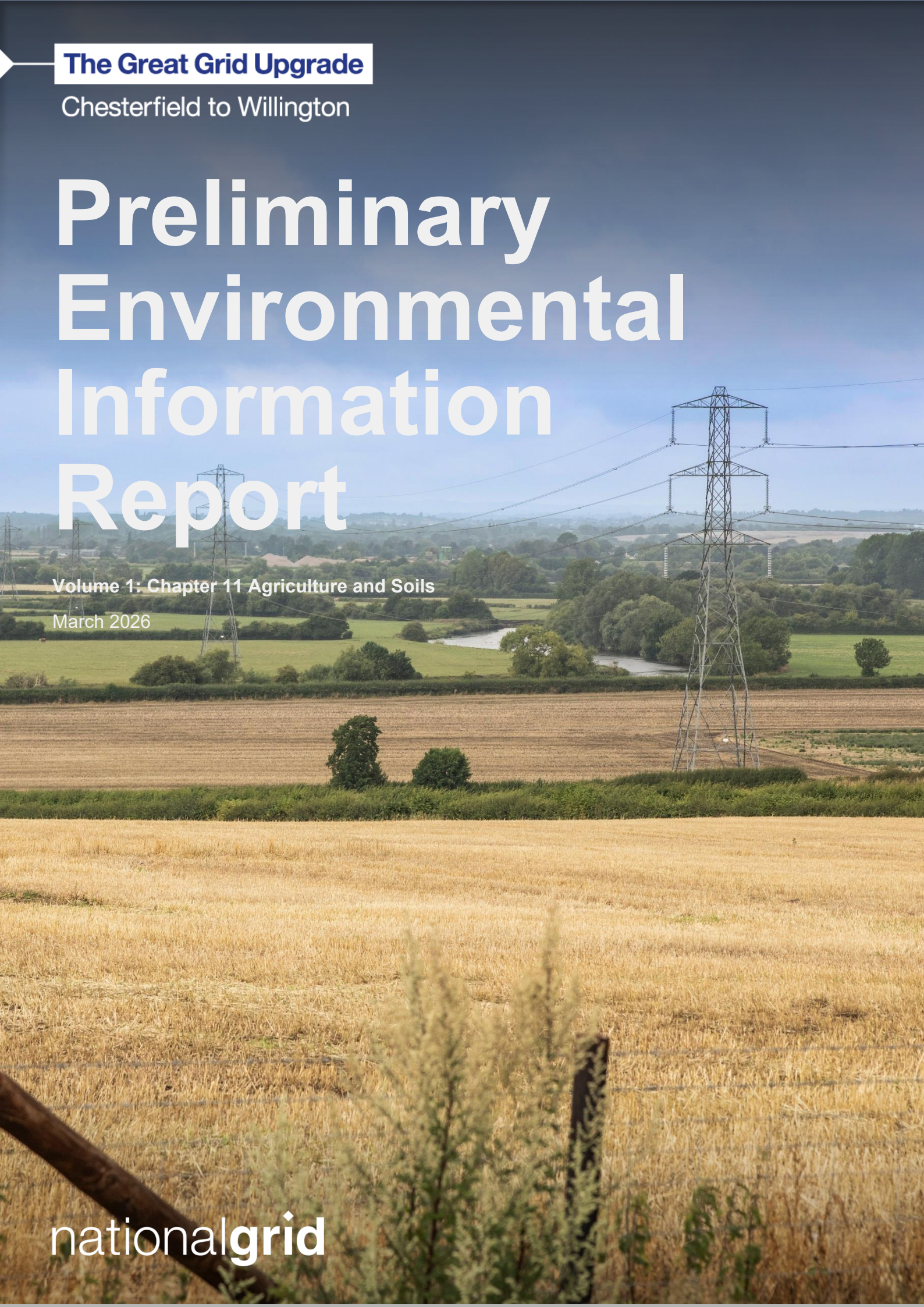
The Great Grid Upgrade

Chesterfield to Willington

Preliminary Environmental Information Report

Volume 1: Chapter 11 Agriculture and Soils

March 2026



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Contents

11. Agriculture and Soils

11.1 Overview

11.1.1 This chapter reports the preliminary assessment of the likely significant agriculture and soils effects that could result from the Chesterfield to Willington Project (the 'Project') during construction and operation and describes:

- relevant legislation and planning policy context;
- consultation and engagement undertaken to date;
- the methodology for assessment;
- relevant baseline information;
- potential effects of the construction phase;
- potential effects of the operational phase;
- potential additional mitigation measures; and
- residual effects.

11.1.2 This chapter covers effects on the following receptors during construction and operation:

- agricultural land;
- soils; and
- agricultural landholdings.

11.1.3 This chapter should be read in conjunction with:

- **Chapter 4 Description of the Project**.
- **Chapter 5 Approach to Preliminary Environmental Information Report**.
- **Chapter 6 Landscape and Visual**. This chapter includes elements relating to landscaping and planting.
- **Chapter 7 Ecology and Biodiversity**. This chapter includes elements which relate to soil resources and receptor sensitivity.
- **Chapter 8 Historic Environment**. This chapter includes elements which relate to soil receptor sensitivity criteria and covers buried archaeology.
- **Chapter 9 Hydrology and Land Drainage**. This chapter includes elements which relate to land drainage.
- **Chapter 10 Geology and Hydrogeology**. This chapter includes elements which relate to geology (soil parent material).
- **Chapter 13 Air Quality**. This chapter includes elements relating to impacts from soil excavation and stockpiling.

- **Chapter 15 Socio-economics, Recreation and Tourism**. This chapter includes elements which relate to agricultural landholdings.
- **Chapter 17 Cumulative Effects**. This chapter includes both intra and inter cumulative effect interactions including on agriculture and soils with other topics areas and other committed schemes.

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

- **Figure 11.1 National Soil Map & Agriculture and Soils Study Area**;
- **Figure 11.2 Provisional Agricultural Land Classification (ALC) Mapping**;
- **Figure 11.3 Detailed ALC Mapping (Post-1988)**;
- **Figure 11.4 Agri-Environment Schemes**; and
- **Figure 11.5 Woodland and Forestry Schemes**.

11.2 Legislation, Planning Policy and Guidance Context

Legislation

11.2.1 A summary of the key legislation considered in the scope of effects on agriculture and soils is outlined below:

- Agricultural Land (Removal of Surface Soil) Act 1953 (Ref 11.1) – '*An Act to make it an offence to remove surface soil from land in certain circumstances; and for purposes connected therewith.*'
- Environment Act 2021 (Ref 11.2) – '*An Act to make provision about targets, plans and policies for improving the natural environment; for statements and reports about environmental protection; for the Office for Environmental Protection; about waste and resource efficiency; about air quality; for the recall of products that fail to meet environmental standards; about water; about nature and biodiversity; for conservation covenants; about the regulation of chemicals; and for connected purposes.*'

National Policy Statements

11.2.2 **Chapter 2 Legislative, Regulatory and Planning Policy Context** sets out the overarching policy relevant to the Project including the Overarching National Policy Statement (NPS) for Energy (EN-1) (Ref 11.3) and NPS for Electricity Networks Infrastructure (EN-5) (Ref 11.4). **Table 11.1** sets out the requirements of both NPSs relevant to agriculture and soils and how these have been considered within this chapter[1].

[1] The updated NPSs came into force on 6 January 2026; however, this post-dated the drafting and assessment work within this chapter and so are not reflected within the relevant policy descriptions in this chapter, which are instead based on the 2023 versions of the NPSs that were in force at the time of preparing the Chapter. These sections will be updated in the ES as part of the Application; however, after initial review and consideration, it is not anticipated that the updates to the NPS will result in any material changes to the assessment methodology or the conclusions in this chapter.

Table 11.1: National Policy Statements relevant to agriculture and soils

Policy Reference	Policy Context	How It Will Be Considered
Overarching National Policy Statement for Energy (EN-1)		
Paragraph 5.11.12	Sets out the preference for the use of poorer quality land (Grades 3b, 4 and 5) over Best and Most Versatile (BMV) land (defined as land in Grades 1, 2 and 3a).	Where practicable, land of lower quality has been chosen for the placement of temporary and permanent infrastructure in preference to that of higher quality. Further information on the proposed route alignment selection process is provided in **Chapter 3 Main Alternatives Considered**. The extent of BMV land affected will continue to be minimised through the evolution of the design. The extent of BMV land has been determined through comparison with available online Agricultural Land Classification (ALC) mapping in line with the 1988 criteria (Ref 11.5) and will be confirmed through ALC surveys. An Outline Soil Management Plan (SMP) will be submitted in support of the development consent order (DCO) application and will be developed in line with current good practice, including with reference to the Department for Environment, Food and Rural Affairs (Defra) Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 11.6).
Paragraph 5.11.13	'*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.*'	The nature of the soils present will be assessed within the Environmental Statement (ES), informed through ALC surveys and mitigation measures set out to minimise the potential impacts on soil properties and thus soil health.
Paragraph 5.11.14	'*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.*'	An Outline SMP, aligned with good practice, will be submitted as part of the DCO application. A detailed SMP will then be developed and adhered to throughout the construction of the Project.

Policy Reference	Policy Context	How It Will Be Considered
Paragraph 5.11.23	This paragraph acknowledges that mitigation is not always possible for direct effects for energy projects; however, the applicant should seek to minimise these effects by the application of good design principles including the protection of soils during construction.	The draft Order Limits and the proposed design (including temporary construction compounds, haul and access roads) has been carefully evaluated and minimised to meet the essential requirements for the safe construction and operation of the Project. An Outline SMP will be submitted in support of the DCO application which will outline methods to protect soils during construction.
Paragraph 5.11.34	This paragraph states that development should not be built on BMV land without justification, and poorer quality land should be used preferentially. Economic benefits of the land should also be accounted for.	Where practicable, land of lower quality has been chosen for the placement of temporary and permanent infrastructure in preference to that of higher quality. Further information is provided in **Chapter 3 Main Alternatives Considered**. The extent of BMV land affected will continue to be minimised through the evolution of the design. Compensation agreements will take account of the economic impacts of the Project on BMV land but lie outside of the Environmental Impact Assessment (EIA) process. The extent of BMV land has been determined through comparison with available online ALC mapping in line with the 1988 criteria and will be confirmed through ALC surveys. An Outline SMP will be submitted in support of the DCO application and will be developed in line with current good practice, including with reference to the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.
National Policy Statement for Electricity Networks (EN-5)		
Paragraph 2.9.25 (third and final bullet points)	The third bullet point acknowledges the impact to soils (including peat soils) by the undergrounding of cables. The final bullet point highlights the requirement to minimise impacts on agricultural land and soil resources. It also states that appropriate surveys should be undertaken to inform these	Where practicable, land of lower quality has been chosen for the placement of temporary and permanent infrastructure in preference to that of higher quality. In addition, the undergrounding of cables will be kept to a minimum with clear rationality for their need provided in **Chapter 3 Main Alternatives Considered**. The extent of BMV land has been determined through comparison with available online ALC mapping in line with the 1988 criteria and will be confirmed through ALC surveys. An Outline SMP will be submitted in

Policy Reference	Policy Context	How It Will Be Considered
	assessments, and that mitigation should be in line with the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites.	support of the DCO application and will be developed in line with current good practice, including with reference to the Defra Construction Code of Practice for the Sustainable Use of Soils on Construction Sites
Paragraph 2.9.58	'*There is little evidence that exposure of crops, farm animals or natural ecosystems to transmission line EMFs* [electric and magnetic fields] *has any agriculturally significant consequences.*'	As per paragraph 11.7.14 of the Scoping Report, due to the lack of evidence of the impact of transmission line EMFs on the sensitive receptors considered within this chapter this matter has been scoped out from further consideration.

Other National Policy

11.2.3 A summary of other relevant national policy considered in the scope of effects on agriculture and soils includes:

- National Planning Policy Framework (Ref 11.7).

Regional and Local Policy

11.2.4 **Chapter 2 Legislative, Regulatory and Planning Policy Context** sets out relevant regional and local policy considered by this Project.

11.2.5 Relevant local policy, specific to agriculture and soils includes:

- South Derbyshire District Council, Adopted Local Plan Part 1 (2016) and Part 2 (2017) (Ref 11.8 and Ref 11.9);
- Erewash Core Strategy 2014 (Ref 11.10);
- Broxtowe Local Plan 2018–2028 (Ref 11.11);
- Derby City Local Plan Part 1 – 2017 (Ref 11.12);
- Adopted North East Derbyshire Local Plan 2014-2034 (Ref 11.13);
- Local Plan for Bolsover District 2020 (Ref 11.14);
- Chesterfield Borough Local Plan July 2020 (Ref 11.15);
- Amber Valley Borough Emerging Local Plan (Ref 11.16);
- The Nottinghamshire Plan 2021-2031 (Ref 11.17);
- Leicestershire County Council Strategic Plan (Ref 11.18); and
- East Midlands Vision for Growth (Ref 11.19).

Guidance

11.2.6 Relevant guidance, specific to agriculture and soils, which has informed this Preliminary Environmental Information Report (PEIR) and will inform the assessment within the ES, includes:

- Safeguarding our Soils. A Strategy for England (Ref 11.20);
- Guide to Assessing Development Proposals on Agricultural Land (Ref 11.21);
- Working with Soil Guidance Note on Benefitting from Soil Management in Development and Construction (Ref 11.22);
- Specification for Topsoil (BS3882:2015) (Ref 11.23);
- Agricultural Land Classification of England and Wales, Revised Criteria and Guidelines for Grading the Quality of Agricultural Land (Ref 11.5);
- Construction Code of Practice for the Sustainable Use of Soils on Construction Sites (Ref 11.6);
- Construction Best Practice for Underground Cable Installation (Ref 11.24);

- Construction Best Practice for Overhead Line Installation (Ref 11.25);
- Good Practice Guide for Handling Soils in Mineral Workings (Ref 11.26);
- A New Perspective on Land and Soil in Environmental Impact Assessment: Institute of Environmental Management and Assessment (IEMA now rebranded as the Institute of Sustainability and Environmental Professionals (ISEP)) (herein the 'IEMA Guidance') (Ref 11.27);
- Design Manual for Roads and Bridges (DMRB) LA 109 – Geology and Soils (Ref 11.28); and
- DMRB LA 112 – Population and Human Health (Ref 11.29).

11.3 Scoping Opinion and Consultation

Scoping Opinion and Stakeholder Engagement

11.3.1 A Scoping Report (Ref 11.30) was prepared and submitted by National Grid to the Planning Inspectorate in October 2024. The Planning Inspectorate provided a Scoping Opinion (Ref 11.31) on behalf of the Secretary of State for Energy Security and Net Zero in December 2024. Responses from the Planning Inspectorate in relation to agriculture and soils and how these requirements will be addressed by the applicant are set out in **Table 11.2**.

Table 11.2: Summary of the Planning Inspectorate's Scoping Opinion comments in relation to agriculture and soils

Scoping Opinion ID	Planning Inspectorate's Comments	Response
3.6.1	*'Soil quality associated with ecosystem services – Operation (and maintenance)' (ID 3.6.1) and 'Land use/ agricultural landholdings – Operation (and maintenance)' (ID 3.6.2):*	Further definition and consideration surrounding how land would be managed and reinstated will be provided within the ES. The likely significant effects on agricultural land quality during the operation (and maintenance) phase has been scoped in and is preliminarily assessed within section 11.7.
3.6.2	*'The Scoping Report confirms that the "majority of the land required for construction would be returned to its pre-construction land use (as agreed with the landowner)". The Inspectorate is content that the ongoing operation, minor repairs and modifications of the Proposed Development are not likely to result in significant effects; this is subject to further definition and information within the submitted application on how land would be managed and reinstated to its pre-construction land use and a condition that is at least as good as its pre-construction condition.*	

Scoping Opinion ID	Planning Inspectorate's Comments	Response
	Paragraph 4.7.8 states that "refurbishment works would require temporary access tracks, a small compound and potentially scaffolding to protect roads and other features during the work". The Inspectorate acknowledges that temporary access tracks and small compound areas required for refurbishment activities are likely to be smaller in extent than during construction. However, the location and extent of temporary access tracks and compounds required for refurbishment activities are not yet determined, nor is the duration or frequency of works. On this basis, the Inspectorate does not agree this matter can be scoped out at this stage. The ES should assess any likely significant effects on agricultural land quality during the operation and maintenance phase based on the expected maximum extent of operational activities.'	
3.6.3	*'BMV land: The ES should contain a clear tabulation of the areas of land in each BMV classification to be temporarily or permanently lost as a result of the Proposed Development, with reference to accompanying map(s) depicting the grades. Specific justification for the use of the land by grade should be provided.'*	ALC surveys will be undertaken and assessment provided as part of the ES chapter. A preliminary assessment including a preliminary justification for the use of the land by grade is provided in section 11.7.
3.6.4	*'Agri Environment Schemes: The ES should identify any Agri Environment Schemes and Woodland and Forestry Schemes present within the DCO boundary. Any likely significant effects on these schemes should be considered within the assessment of effects.'*	Baseline information relating to Agri-Environment Schemes and Woodland and Forestry Schemes is included in section 11.5 and potential effects are included in section 11.7**.** Relevant schemes are presented in **Figure 11.4** and **Figure 11.5**.
3.6.5	*'Agricultural drainage: The ES should include an assessment of any likely significant effects on retained existing agricultural drainage or the removal of this from the construction and operation of the Proposed Development.'*	Potential effects relating to existing agricultural drainage are included as part of the potential effects to agricultural holdings during construction and operation in section 11.7 and assessed within **Chapter 9 Hydrology and Land Drainage**. Control measure HD16 within **Appendix 4A Draft Outline Code of Construction Practice** provides good practice mitigation for this potential effect.

11.3.2 **Table 11.3** provides a summary of the consultation feedback from specific stakeholders as part of the Scoping Opinion which relates to agriculture and soils.

Table 11.3: Summary of stakeholder Scoping Opinion responses in relation to agriculture and soils

Consultee	Summary of Key Topics Discussed and Key Outcomes	Response
Natural England	Natural England is satisfied that the ES will assess the impacts of the Project on the soil within the boundary of the application.	The impacts assessed within the PEIR are consistent with those presented within the Scoping Report. These impacts will be assessed further within the ES.

11.3.3 **Table 11.4** provides a summary of the Stage 1 (non-statutory) consultation responses relating to agriculture and soils, together with a response by the applicant.

Table 11.4: Summary of Stage 1 (non-statutory) consultation in relation to agriculture and soils

Date and Method of Consultation	Consultee	Summary of Key Topics Discussed and Key Outcomes
Stage 1 (non-statutory) consultation response via email September 2024	South Derbyshire District Council (SDCC)	SDCC expects full consideration to be given to agricultural land, particularly best and most versatile. This topic has been scoped in and potential effects to agricultural land are assessed within section 11.7.

11.4 Assessment Methodology

11.4.1 **Chapter 5 Approach to Preliminary Environmental Information Report** sets out the overarching approach used in developing the preliminary environmental information. This section describes the technical methods used to determine the baseline conditions, receptor sensitivity and magnitude of change. This section also identifies further surveys and assessment that will be undertaken and reported in the ES.

Technical Guidance

11.4.2 The assessment principally draws on guidance set out by IEMA (now rebranded as the ISEP as of 2025) on how land and soil should be assessed in EIA (Ref 11.27) and set out within the Scoping Report (Ref 11.30). The IEMA Guidance seeks to move practice away from a narrow focus on quantifying and financially compensating effects on agricultural land and advocates a new and more holistic approach to assessing the soil functions, ecosystem services and natural capital provided by land and soils.

11.4.3 Published guidance relating to soils and land grade (as defined by the ALC system) is limited and therefore the approach is based on technical knowledge and professional judgement. This takes account of highways guidance as set out in the DMRB LA 109 which relates to soils and land grade and promotes assessment that is proportionate to the scale and nature of the Project and the likely effects on soils. DMRB LA 112 provides guidance on assessing impacts to agricultural land holding.

Sensitivity

11.4.4 **Table 11.5** and **Table 11.6** set out the criteria which have been used to determine the sensitivity of receptors specific to agriculture and soils based on the IEMA Guidance and the DMRB LA 109 and LA 112 guidance These include the sensitivity of agricultural soils, topsoils and subsoils in relation to soil function and agricultural land holdings.

Table 11.5: Criteria for sensitivity of agricultural land and soils

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 Areas of Conservation, Special Protection Areas, Ramsar sites); 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; **Archaeology, cultural heritage, community benefits and geodiversity**: Scheduled Monuments and adjacent areas; World Heritage and European Sites; Soils with known archaeological interest; Soils supporting community/recreational/educational access to land covered by National Park designation; and **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 Organisation (UNESCO) Geoparks, Sites of Special Scientific Interest or National Landscapes (an Area of Outstanding Natural Beauty (AONB)), Special Landscape Areas (SLAs) and Geological

Receptor Sensitivity	Soil Resource and Soil Functions
	Conservation Review Sites); Native Forest and woodland soils; Unaltered soils supporting seminatural vegetation (including the UK Biodiversity Action Plan Priority habitats, now referred to as Habitats of Principal Importance); **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 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 (an AONB); and **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, Local Geological Sites, Sites of Nature Conservation Importance, SLAs; Non-Native Forest and woodland soils; **Soil carbon**: Mineral soils; **Soil hydrology**: Important minor catchment pathway for water flows and flood risk management; **Archaeology, cultural heritage, community benefits and geodiversity**: Soils with possible but as yet unproven (prior to being revealed by construction) archaeological interest; Soils supporting community/recreational/educational access to land; and **Source of materials**: Surface mineral reserves that would remain accessible for extraction.
Low	**Biomass production**: ALC Grade 4 and 5 or Urban soils; **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; and **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 11.6: Criteria for sensitivity of agricultural landholding

Receptor Sensitivity	Description
Very High	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	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	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	1) Areas of land in 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	1) Areas of land which are infrequently used on a non-commercial basis.

Magnitude

11.4.5 **Table 11.7** and **Table 11.8** summarises the IEMA Guidance and the DMRB LA 109 and LA 112 guidance which set out the criteria that has been used to assess the magnitude of impact on receptors specific to agriculture and soils.

Table 11.7: Criteria for magnitude of impact on agricultural land and soils

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 11.5** (including effects from 'Temporary Developments'[2]); 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 11.5** (including effects from 'Temporary Developments').

[2] Temporary developments can result in a permanent impact if resulting disturbance or land use changes cause permanent damage to soils.

Magnitude of Impact (Change)	Description of Impacts Restricting Proposed Land Use
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 11.5** (including effects from 'Temporary Developments'[3]); 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 11.5**.
Small	Permanent, irreversible loss over less than 5 ha or a temporary, reversible loss of one or more soil functions, soil volumes, or temporary, reversible loss of soil related features set out in **Table 11.5**; 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 11.5**.
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use.

Table 11.8: Criteria for magnitude of impact on agricultural landholding

Magnitude of Impact (Change)	Description of Impacts Restricting Proposed Land Use
Large	Private property and housing, community land and assets, development land and businesses and agricultural landholdings: 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 electricity infrastructure; 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 landholdings: 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.

[3] Temporary developments can result in a permanent impact if resulting disturbance or land use changes cause permanent damage to soils.

Magnitude of Impact (Change)	Description of Impacts Restricting Proposed Land Use
Small	Private property and housing, community land and assets, development land and businesses and agricultural landholdings: 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 landholdings: 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. If there is no change there is no loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

Significance of effects

11.4.6 Significance of effect has been derived by considering the sensitivity (or value) of the agriculture and soil receptors within the Study Area (as set out in section 11.5), and the magnitude of impact likely to be caused by the activities of the Project. These factors are combined to give an overall significance of effect.

11.4.7 Significance has been derived using the matrix set out in **Table 5.4** in **Chapter 5 Approach to Preliminary Environmental Information Report**. This has been supplemented by professional judgement which, where applicable, has been explained to give the rationale behind the values assigned. Likely significant effects, in the context of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations') (Ref 11.32), are considered to be effects of moderate or greater significance.

Preliminary Assessment Assumptions and Limitations

11.4.8 The assessment has been undertaken based on the preliminary Project design information. This information is iterative and will be updated in the ES as the design evolves. Alterations to the design may lead to changes in land take and soil disturbance, both of which will be accounted for in the assessment presented in the ES. 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.

11.4.9 For the preliminary assessment, it is assumed that all areas temporarily disturbed during construction would be reinstated and the pre-construction land use resumed. Permanent land take relates to the land lost to permanent infrastructure associated with the Project. Relevant elements of the Project in relation to agriculture and soils are:

- overhead line construction including:
  - establishment of construction compounds;
  - earthworks including, temporary drainage installation where required;
  - installation of access points (bellmouths);
  - installation of access tracks (including culverts and bridges) and demarcated pylon working platforms;
  - installation of pylon foundations;
  - pylon assembly and erection;
  - installation of temporary works;
  - establishment of machine sites for conductor stringing;
  - temporary earthing;
  - conductor stringing;
  - removal of construction equipment and temporary works;
  - removal of temporary access (access points and haul roads);
  - removal of construction compounds; and
  - reinstatement of ground and restoration of soils.
- the new Chesterfield Substation; and
- diversionary works, in particular the undergrounding of existing overhead lines.

11.4.10 For the purposes of this preliminary assessment temporary haul roads required for construction access have been assumed to be consistently 9 m wide, which is considered to be worst case. Haul roads for construction access will be temporary; no permanent land take is proposed. In some instances, existing access tracks may be upgraded to facilitate construction access instead of installation of temporary haul road.

11.4.11 During operation, existing access tracks will be used for maintenance. Access for vegetation management, telecommunications and fibre optic maintenance would be along routes agreed with the landowners and may require interlocking trackway panels which would provide protection for underlying soils.

11.4.12 Potential impacts from disturbance to soils during construction, from access across unstripped land for overhead line installation including the stringing of conductors between pylons have been assessed qualitatively within section 11.7.

11.4.13 In order to construct the new 400 kV overhead line connection safely and efficiently, sections of existing overhead or underground third-party services (for example Distribution Network Operators of lower voltage power lines, or telecommunication lines) would be modified (undergrounded, protected or relocated). In this instance the

undergrounding of lines would be required which will impact upon soils; the relevant parameters (such as trench widths) are provided within **Chapter 4 Description of the Project**.

11.4.14 It has been assumed at this time that any areas required for Biodiversity Net Gain (BNG) will not be included within the draft Order Limits. Therefore, any areas required for BNG are outside the agriculture and soils Study Area and any change in land use (for example where the BNG habitat would constitute a change in land use away from agricultural production or which may result in a change in the land grade (i.e. example rewetting of agricultural land)) will not be assessed within this chapter. However, this will be reviewed throughout the preparation of the ES and where required will be included within the final ES.

Further Assessment Within the ES

11.4.15 The ES will be informed by ALC surveys 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.

11.4.16 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 is provided in **Chapter 5 Approach to Preliminary Environmental Information Report** to explain how professional judgement, where used, has determined the significance value. Where the matrix indicates two or more levels of significance are possible, professional judgement will be applied to determine the level of significance.

11.5 Baseline Conditions

Study Area

11.5.1 The Study Area for agriculture and soils comprises the area directly impacted by the Project, which for the purposes of informing this chapter comprises the draft Order Limits. This represents the extent that potential impacts associated with direct temporary or permanent disturbance of agriculture and soils is likely to occur. This is considered an appropriate study area based on professional judgement, knowledge of similar projects and DMRB LA 109. The Study Area for agriculture and soils is shown on **Figure 11.1 National Soil Map & Agriculture and Soils Study Area** to **Figure 11.5 Woodland and Forestry Schemes** in **Volume 2**.

11.5.2 It should be noted that the extent of agricultural land and associated soils impacted will not be the entire draft Order Limits.

11.5.3 Three receptors which would be potentially affected by the Project are identified as follows:

- agricultural land (including BMV land);
- soil function; and
- agricultural landholdings.

Data Collection

11.5.4 The baseline within this chapter has been informed by a desk study which has drawn on the following sources of information:

- British Geological Survey (BGS) Geology Viewer (Ref 11.33);
- Agricultural Land Classification – Provisional (England) (Ref 11.34);
- Post-1988 Agricultural Land Classification (England) (Ref 11.34);
- Soil data and map from National Soils Resources Institute at Cranfield University (Ref 11.35); and
- Likelihood of Best and Most Versatile (BMV) Agricultural Land - Strategic scale maps (Ref 11.36).

Further Data to Be Collected to Inform the ES

11.5.5 In addition to the data collected for this PEIR, the ES will be informed by ALC surveys. The surveys are provisionally scheduled to commence in winter 2025/2026. The surveys will be undertaken within the draft Order Limits and will be conducted at a density of a 100 m grid, in line with the ALC guidelines (Ref 11.5) in consultation with Natural England. The surveys will also gather soil parameter information to inform the assessment of soil function and supporting ecosystem services.

11.5.6 These surveys will help to inform the design of the Project by providing detailed information on the distribution of ALC gradings across the draft Order Limits with the aim of potentially reducing the area of BMV which will be required for permanent infrastructure.

Existing Baseline Conditions

11.5.7 Baseline conditions have been gathered from desk-based information and presented with reference to the section of the Project that they are located in.

Geology

11.5.8 Superficial geology comprises alluvium (clay, silt, sand and gravel) across the entire draft Order Limits with glacial till (diamicton) being present in all areas except **Section 1**. From Ockbrook to Willington Substation (**Sections 5** and **6**) extensive sand and gravel deposits occur.

11.5.9 Bedrock geology largely comprises Pennine Lower and Middle Coal Measures which are formed of interbedded layers of mudstone, siltstone and sandstone from Chesterfield Substation to Morley (**Sections 1**, **2** and **3**). As the proposed route alignment continues to the south other sedimentary bedrock units underly the route including sandstones, mudstones and siltstone.

11.5.10 More information on the geology can be found in **Chapter 10 Geology and Hydrogeology.**

Soils

11.5.11 A Soil Association is a group of soil types with similar characteristics which typically are located together in the UK landscape. Twenty-one Soil Associations were identified within the draft Order Limits (**Figure 11.1 National Soil Map & Agriculture and Soils Study Area**) as follows (listed from north to south):

- Neutral Restored Opencast: Restored opencast coal workings. Slowly permeable seasonally waterlogged compacted fine loamy and clayey disturbed soils. Often stony with thin topsoil. Risk of water erosion.
- Bardsey: Slowly permeable seasonally waterlogged loamy over clayey and fine silty soils over soft rock. Some well drained coarse loamy soils over harder rock.
- Rivington 1: Well drained coarse loamy soils over sandstone. Locally associated with similar soils affected by groundwater.
- Dale: Slowly permeable seasonally waterlogged clayey, fine loamy over clayey and fine silty soils on soft rock often stoneless.
- Fladbury 3: Stoneless clayey, fine silty and fine loamy soils affected by groundwater. Flat land. Risk of flooding.
- Dunkeswick: Slowly permeable seasonally waterlogged fine loamy and fine loamy over clayey soils associated with similar clayey soils.
- East Keswick 2: Deep well drained fine and coarse loamy soils. Steep slopes locally.
- Hodnet: Reddish fine and coarse loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some similar well drained reddish fine loamy soils. Slight risk of water erosion.
- Worcester: Slowly permeable non-calcareous and calcareous reddish clayey soils over mudstone, shallow on steeper slopes. Associated with similar non-calcareous fine loamy over clayey soils. Slight risk of water erosion.
- 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.
- Compton: Stoneless mostly reddish clayey soils affected by groundwater. Flat land. Risk of flooding.
- Salwick: Deep reddish fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Some deep well drained coarse loamy soils. Some fine loamy soils affected by groundwater.
- Wharfe: Deep stoneless permeable fine loamy soils. Some similar soils variably affected by groundwater. Flat land. Risk of flooding.
- Fladbury 2: Stoneless clayey soils variably affected by groundwater some with sandy subsoils. Some similar fine loamy soils. Flat land. Risk of flooding.
- Wick 1: Deep well drained coarse loamy and sandy soils locally over gravel. Some similar soils affected by groundwater. Slight risk of water erosion.

- Salop: Slowly permeable seasonally waterlogged reddish fine loamy over clayey, fine loamy and clayey soils associated with fine loamy over clayey soils with slowly permeable subsoils and slight seasonal waterlogging.
- Bromsgrove: Well drained reddish coarse loamy soils mainly over soft sandstone but deep in places. Associated fine loamy soils with slowly permeable subsoils and slight seasonal waterlogging. Risk of water erosion.
- Arrow: Deep permeable coarse loamy soils affected by groundwater.
- Thames: Stoneless mainly calcareous clayey soils affected by groundwater. Flat land. Risk of flooding.
- Bridgnorth: Well drained sandy and coarse loamy soils over soft sandstone. Occasional deeper soils. Risk of water and wind erosion.
- Brockhurst 2: Slowly permeable seasonally waterlogged reddish fine loamy over clayey and clayey soils. Some reddish clayey alluvial soils affected by groundwater.

Agricultural Land Classification

11.5.12 Provisional ALC mapping for the Study Area is presented in **Figure 11.2 Provisional ALC Mapping** in **Volume 2**. It shows that the agricultural land within the draft Order Limits is predominantly ALC Grade 3 and Grade 4 land which covers approximately 28.57 per cent and 56.78 per cent of the draft Order Limits, respectively. Grade 4 land is mostly located to the north of Dale Abbey, while Grade 3 land is primarily to the south of Dale Abbey. There is a relatively small portion of ALC Grade 2 land (approximately 14.60 per cent), mainly present to the south and east of Derby.

11.5.13 The provisional ALC mapping does not split Grade 3 land into Subgrades 3a and 3b. Subgrade 3a land, along with Grade 1 and Grade 2 land, comprises BMV agricultural land. This distinction can only be confirmed through an ALC survey.

11.5.14 As illustrated in **Figure 11.3 Detailed ALC Mapping (Post-1988)**, ALC surveys have been conducted previously at Stonebroom, Derbyshire which is north of Alfreton. The area which is within the draft Order Limits is very limited. Where the data is present Grade 4 land is indicated to the west of the Project with some areas of Grade 3b and Grade 3a. Very limited areas of Grade 3a and 3b are also indicated within the draft Order Limits near Ambaston.

11.5.15 Based on the provisional ALC mapping, the extent of each land grade present within the draft Order Limits is as shown in **Table 11.9**. No Grade 1 or Grade 5 land was identified within the draft Order Limits. **Table 11.10** shows the estimates of provisional ALC grades required for temporary and permanent features of the Project which will potentially require the disturbance of soils. Regarding the pylon indicative working area (which will be temporary), this represents only the additional land required for the construction of the pylons and does not include the area required for the pylon foundation (which will be permanent). This is to avoid confusion and duplication.

Table 11.9: Provisional ALC grade across the Project

ALC Grade	Area (ha)	%
Grade 1	0.00	0.00
Grade 2	250.03	14.60
Grade 3	489.38	28.57
Total Potential BMV	739.41	43.17
Grade 4	972.51	56.78
Total Agricultural	1,711.92	99.95
Total Non-Agricultural	0.83	0.05
Total	**1,712.75**	**100**

Table 11.10: Provisional ALC grade land required for temporary and permanent features

	Temporary				Permanent		Total
ALC Grade	Construction Compounds (ha)	Haul Roads (ha)	Pylon Indicative Working Area (ha)	Diversionary works (ha)	Indicative Pylon Foundation (ha)	Chesterfield Substation (including access road) (ha)	
Grade 1	0.00	0.00	0.00	0.00	0.00	0.00	**0.00**
Grade 2	2.86	9.74	0.73	0.00	1.12	0.00	**14.45**
Grade 3	13.22	16.68	2.93	2.48	2.04	1.87	**39.22**
Total Potential BMV	*16.08*	*26.42*	*3.66*	*2.48*	*3.16*	*1.87*	**53.67**
Grade 4	10.56	32.01	5.80	4.77	4.06	8.19	**65.39**
Total Agricultural	**26.64**	**58.43**	**9.46**	**7.25**	**7.22**	**10.06**	**119.06**
Total Non-Agricultural	**0.00**	**0.20**	**0.00**	**0.66**	**0.00**	**0.00**	**0.86**

Land use

11.5.16 Satellite imagery and Site observations from the ecological surveys indicate that the agricultural land within the draft Order Limits is predominately arable land and grassland. Field boundaries are lined with hedges, trees and roads throughout the draft Order Limits.

11.5.17 Limited areas of land, totalling approximately 13.5 ha, within the draft Order Limits are covered by Countryside Stewardship or Environmental Stewardship Agreements (see **Figure 11.4 Agri-Environment Schemes**). More limited areas are covered by Woodland Grant (WG) Schemes and Felling Licences (see **Figure 11.5 Woodland and Forestry Schemes**) and described below.

11.5.18 In total, permanent land take from Higher Level Stewardship (HLS) and WG schemes is approximately 0.1 ha (for Pylon 4CW44) with an area of 1.17 ha to be required as temporary land take. A summary of these schemes is provided below.

Higher Level Stewardship Schemes

11.5.19 Two separate HLS Schemes fall within the draft Order Limits. A summary of the schemes and the relevant elements of the Project that interact with the schemes, both temporary and permanent, are provided below.

Higher Level Stewardship Scheme relating to grassland (Ref. AG00427670)

11.5.20 Proposed haul roads cut through two separate areas under a Higher Level Stewardship Scheme relating to grassland (Ref. AG00427670).

- One section of proposed haul road connecting Pylons 4CW40 and 4CW41 is approximately 65 m in length and would impact an area of approximately 0.06 ha.
- A proposed haul road connecting Pylons 4CW44 and 4CW45 has an approximate length of 280 m and impacts an area of approximately 0.25 ha. An area of approximately 0.56 ha is needed for the pylon working area for Pylon 4CW44 with a permanent footprint required for the pylon foundation of approximately 0.1 ha.

Higher Level Stewardship Scheme relating to buffer strips and field margins, rotational land, wetland and grassland (Ref. AG00434149)

- A number of fields from the scheme are present between Pylons 4CW129 and 4CW134. A proposed haul road of approximate length of 150 m would intersect an area of 0.14 ha between Pylons 4CW129 and 4CW130.
- A further approximate 150 m length of proposed haul road will cut through a field under a HLS Scheme impacting an area of 0.14 ha which connects to Pylon 4CW133 from the B5010 Nottingham Road.

Woodland Grant Schemes

11.5.21 Impacts to WG Schemes are very limited. A 22 m length of haul road impacting an area of 0.02 ha of woodland associated with Manor Farm is required for access to Pylons 4CW132 and 4CW133. Additionally, an area of approximately 0.1 ha may need to be removed to allow installation of the overhead line.

Future Baseline

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

11.5.23 The future baseline for agriculture and soils is not expected to change within the timeframe of the Project, during construction and operation, which is assumed to be approximately 80 years. The Met Office's UK Climate Projections (UKCP18) up to 2100 (Ref 11.37) predict that the future climate will consist of warmer winters with more intense rainfall events. The overall annual rainfall is expected to remain consistent with current levels; however, increased rainfall is anticipated during winter with decreases in rainfall during the summer months. The anticipated increase in volume and intensity of rainfall events will increase the risk of soil erosion and runoff, risking reducing topsoil thickness and thus land quality if not properly mitigated.

11.5.24 The global annual temperature is predicted to increase by 2 °C by 2100. This increase in global temperature will increase soil surface cracking and the increased intensity of rainfall events may increase total field capacity days. However, these changes combined with extreme weather events mean that impacts will be variable.

11.5.25 Farming and land management practices may also change in the future regardless of whether the Project is implemented. It is not currently practicable to anticipate what changes these may be; however, they will be assessed within the ES if potential future changes become known.

11.5.26 In the absence of the Project no material change to the baseline is anticipated.

11.6 Design Embedded and Good Practice Mitigation Measures

11.6.1 As set out in **Chapter 5 Approach to Preliminary Environmental Information Report**, mitigation measures fall into one of three categories: design embedded mitigation measures; good practice measures; and additional mitigation measures. Those measures relevant to the assessment of agriculture and soils effects are set out below.

Design Embedded Mitigation Measures

11.6.2 An optioneering process, as described in **Chapter 3 Main Alternatives Considered**, has been undertaken to identify the preferred routeing and siting of the proposed infrastructure to ensure that, where reasonably practicable, environmental effects are avoided or reduced. Regarding agriculture and soils, this focuses on reducing the area of agricultural land and soil disturbance required for the Project as much as practicable, particularly during construction.

11.6.3 Temporary accesses required to facilitate construction would be designed as far as reasonably practicable to limit issues of severance and fragmentation to agricultural landholdings and farm activities as a result of the works.

11.6.4 Further embedded and as required additional design measures will be developed as the Project design evolves including measures to minimise the extent of land take required to construct, maintain and operate the Project.

Good Practice Mitigation Measures

11.6.6 A range of standard good practice mitigation measures for the Project would be adopted throughout the duration of the construction phase. A Draft Outline Code of Construction Practice is provided in **Appendix 4A Draft Outline Code of Construction Practice**. The control measures relevant to the agriculture and soils assessment for the Project include general Site management that in addition to agriculture and soils specific measures help manage impacts associated with the construction phase. These include good Site management and control measures as outlined in measures GG01, GG02, GG03, GG04, GG05, GG06, GG17, GG22 and GG27. In addition, air quality measures on earthworks (AQ16) and overlapping hydrology measures related to storage near watercourses (HD02) and approach to land drains (HD16) are also relevant to this chapter.

11.6.7 The topic specific measures which are relevant to the control and management of impacts that could affect agriculture and soils include:

- AS01: A SMP would also be developed to set out soil mitigation measures to protect soil resources and agricultural land during the stages of preconstruction, construction, and post construction. The Outline SMP would include but is not limited to:
  - details of the soil resources present;
  - how topsoil and subsoil would be stripped and stockpiled based on their specific characteristics;
  - suitable conditions for when handling soil would be undertaken and climatic stop conditions;
  - principles to determine suitable soil storage locations;
  - how soil stockpiles would be designed taking into consideration site conditions and the nature/composition of the soil;
  - specific measures for managing sensitive soils;
  - suitable protective measures (such as trackways) where soil stripping can be avoided, based on sensitivity of the environment and proposed works; and
  - approach to reinstating soil that has been compacted, where required.
- 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) would be recreated. This would be achieved up to a depth of 1.2 m (or the maximum natural soil depth if this is shallower). Any agreements to restore land to a condition as discussed with the landowner would be fully recorded, prior to soil disturbance.
- AS03: Where practicable and safe to do so, existing access to and from residential, commercial, community and agricultural land uses would 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 would be communicated to affected parties at the start of the Project/at the start of the relevant works, with any changes communicated in advance of the change being implemented. Where existing field-to-field access points require alteration because of construction, alternative field access would be provided (if required) in consultation with the landowner/occupier.

- AS04: Existing water supplies for livestock that have been notified to the Project by the landowner before construction starts would be maintained or alternatives put in place in advance of any disturbance. Where supplies would be lost or access compromised by construction works, temporary alternative supplies would be provided where necessary. Water supplies would be reinstated following construction, where practicable.
- AS05: Should animal bones be discovered during construction, which may indicate a potential burial site (relating to mass graves of cloven-hooved animals or birds as result of disease/disease spread prevention), works would cease in isolated areas of the finds, and advice would be sought from the Animal Health Regional Office on how to proceed, relevant to the origin and age of the materials found.
- AS06: In the event of a notification by Defra of a disease outbreak in the vicinity of the site that requires the cessation of activities, all movement of plant and vehicles between fields would cease. Advice would be sought from Defra to develop suitable working methods required to reduce the biosecurity risk associated with the continuation of works.
- AS07: 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 would also be included in the SMP.

11.6.8 No control mitigation measures are proposed for the operation phase.

11.7 Preliminary Assessment of Effects

11.7.1 This section sets out the potential effects on agriculture and soils arising from the construction and operation of the Project. A description of each of these stages is set out in **Chapter 4 Description of the Project**.

11.7.2 The preliminary assessment of likely significant effects is then presented. The preliminary assessment assumes that the design embedded, and good practice mitigation measures (described in section 11.6 and outlined within the **Appendix 4A Draft Outline Code of Construction Practice)** are in place before assessing the effects. This is in accordance with the IEMA Guidance as part of preparing a proportional assessment (Ref 11.27).

11.7.3 The assessment is ongoing and is subject to change in response to the ongoing development of the Project. A full detailed assessment will be presented within the ES submitted with the DCO application.

Likely Significant Effects

Construction phase

11.7.4 The potential effects that could result from the construction of the Project are:

- temporary loss of agricultural land (including BMV land);
- effects on soil quality associated with ecosystem services; and
- effects on agricultural landholdings.

Operational phase

11.7.5 The potential effects that could result from the operation of the Project are:

- permanent loss of agricultural land (including BMV land); and
- effects on agricultural landholdings.

Preliminary construction effects

Construction – temporary loss of agricultural land (including BMV land)

11.7.6 During construction there would be a potential temporary loss of BMV land (defined as ALC Grades 1, 2 and 3a) as a result of construction activities. There would be disturbance to soils, either from access across unstripped land for overhead line installation including the stringing of conductors between pylons, or due to the soil stripping required for underground cable installation, pylon work areas, construction compounds, and haul and access roads establishment. The removal of land from production would be temporary, with the exception of the pylon footprint.

11.7.7 To undertake this assessment, publicly available provisional ALC data and detailed data where available has been used. The provisional ALC data does not differentiate between Grade 3a (BMV) and Grade 3b (non-BMV); a worst-case perspective has been taken and all land provisionally mapped as Grade 3 has the potential to be BMV land. Based upon available data approximately 49 ha of BMV land (13 ha of Grade 2 and 36 ha of Grade 3) would be required for construction.

11.7.8 The sensitivity of agricultural land is low (Grade 4 land) to very high (Grade 2 land) and the magnitude of impact, following embedded and good practice mitigation (described in section 11.6 and the **Appendix 4A Draft Outline Code of Construction Practice**), is negligible adverse. Therefore, there is likely to be a direct, temporary, short to medium term minor adverse effect (**not significant**).

Construction – effects on soil quality associated with ecosystem services

11.7.9 Soil supports a number of ecosystem services which can be damaged during construction due to improper soil handling and management procedures. Soil may become compacted due to vehicle movements or storage within stockpiles. Compacted soil has a reduced porosity for air and water and reduces the soil biodiversity, carbon and the loss of soil's water filtering/storage function. Degradation of topsoil can also occur due to mixing with subsoil and contamination with other materials (e.g. wastes or invasive plant species) during the stripping, excavation and storage of soils.

11.7.10 Construction activities such as diversionary work (the undergrounding of power lines), pylon work areas (and permanent foundations), construction compounds, the Chesterfield Substation expansion and haul roads will require the stripping and stockpiling of soil resources and therefore a potential impact on the soil resources and the ecosystem services provided. All with the exception of the pylon foundations and Chesterfield Substation (including its permanent access road) would be temporary. Disturbance to soils could also occur from access across unstripped land for overhead line installation including the stringing of conductors between pylons.

11.7.11 Based on available information approximately 119 ha of land would be required to be stripped to enable the Project with additional areas of land being disturbed (but not stripped). Of this total 102 ha would be required for temporary works with the remaining 17 ha being permanently removed for infrastructure. Additionally, the temporary land take from HLS and WG schemes is approximately 1 ha.

11.7.12 The sensitivity of soil quality and its associated ecosystem services is low to high due to their soil carbon, soil hydrology and support of valued features (such as woodland) and the magnitude of impact, following embedded and good practice mitigation (described in section 11.6 and the **Appendix 4A Draft Outline Code of Construction Practice**), is negligible adverse. Therefore, there is likely to be a direct, temporary, short to medium term minor adverse effect (**not significant**).

Construction – effects on agricultural landholdings

11.7.13 During construction there would be potential impacts on agricultural operations due to disturbance (in particular where livestock are present), fragmentation, access restrictions or disruption to water supplies or land drainage. Currently the access requirements by landowners to areas of land needed for the Project during construction are not clear. However, access requirements are likely to be variable and seasonally dependant, such as increased access needed during seeding or harvesting of crops.

11.7.14 Commitments set out within the **Appendix 4A Draft Outline Code of Construction Practice** to maintain access throughout construction, would reduce the effects to agricultural land use. Potential effects on land drainage are covered in **Chapter 9 Hydrology and Land Drainage**. By the end of the construction phase, all land required temporarily would be reinstated and construction phase impacts on agricultural operations would be dealt with through compensation agreements (which lies outside of the EIA process).

11.7.15 The sensitivity of agricultural holdings is anticipated to be low to very high due to the likely varied nature of land use and access requirements and the magnitude of impact, following embedded and good practice mitigation (described in section 11.6 and the **Appendix 4A Draft Outline Code of Construction Practice**), is negligible adverse. Therefore, there is likely to be a direct, temporary, short term minor adverse effect (**not significant**).

Preliminary operational effects

Operation – permanent loss of agricultural land (including BMV land)

11.7.16 During operation there would be a permanent loss of agricultural land and associated soils for the permanent infrastructure pylon footings and the new Chesterfield Substation Site including its permanent access road.

11.7.17 The permanent loss of agricultural land is anticipated to be approximately 17 ha, of which 4 ha is potentially classified as BMV land. The total permanent land take from HLS and WG schemes is approximately 0.1 ha.

11.7.18 The total area of BMV impacted is not yet known and will be assessed following ALC surveys as part of the ES. 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). Although it is not practicable to mitigate the permanent loss of agricultural land, embedded mitigation includes reducing the areas of land to be impacted through iterative design, reducing the area of permanent land take required for the Project.

11.7.19 The sensitivity of agricultural land is low (Grade 4) to very high (Grade 2) and the magnitude of impact, following embedded mitigation, is medium adverse as between 5 and 20 ha of agricultural land will be permanently lost. Therefore, there is likely to be a direct, permanent, long term major adverse effect (**significant**).

Operation – effects on agricultural landholdings

11.7.20 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 land agreements (which lie outside of the EIA process). Existing land drainage within agricultural fields has the potential to be altered during operation as a result of the permanent infrastructure; however, field drainage is not yet known. This will be assessed further within the ES and within **Chapter 9 Hydrology and Land Drainage** of this PEIR. Maintenance activities have the potential to impact agricultural operations such as through restricting access to the land to undertake repairs; however, these will be managed through the applicant's permanent easements with the landowners (which lie outside of the EIA process).

11.7.21 The sensitivity of agricultural holdings is anticipated to be low to very high due to the likely varied nature of land use and access requirements and the magnitude of impact is negligible adverse. Therefore, there is likely to be a direct, temporary, medium to long term minor adverse effect (**not significant**).

11.8 Potential Additional Mitigation Measures

11.8.1 Additional mitigation comprises measures over and above any design embedded and good practice mitigation measures. At this stage, no additional mitigation measures have been developed for agriculture and soils for either construction or operation. Additional mitigation measures may be developed as the Project design evolves and ALC surveys are undertaken.

11.9 Monitoring

11.9.1 Monitoring of soil handling, storage and reinstatement activities would be required during construction, and full details of what would be monitored and the roles and responsibilities associated with the monitoring will be set out in the Outline Soil Management Plan (submitted as part of the DCO application).

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

11.10 Residual Effects

11.10.1 As no additional mitigation is currently proposed the residual effects remain unchanged (**not significant**) for all potential effects with the exception of operational impacts from permanent loss of agricultural land (including BMV land) which remains **significant** due to the area of BMV required for permanent infrastructure. However, as the Project design evolves the applicant will seek to further refine and reduce the area of BMV required. ALC surveys will also support the applicant's understanding of the distribution of ALC gradings across the draft Order Limits to support the refinement of the design and reduce adverse effects where possible. This will be included within the ES.

11.11 Summary

11.11.1 **Table 11.11** summarises the preliminary assessment of effects, potential additional mitigation measures and residual effects.

Table 11.11: Summary of residual effects for agriculture and soils

Description of the Effect	Sensitive Receptor	Significance of Effect with Design Embedded and Good Practice Mitigation	Additional Mitigation Measure	Residual Effect
Construction – temporary loss of agricultural land (including BMV land)	Agricultural land	Minor adverse effect (**not significant**)	None	Minor adverse effect (**not significant**)
Construction – effects on soil quality associated with ecosystem services	Soils	Minor adverse effect (**not significant**)	None	Minor adverse effect (**not significant**)
Construction – effects on agricultural landholdings	Agricultural landholdings	Minor adverse effect (**not significant**)	None	Minor adverse effect (**not significant**)
Operation – permanent loss of agricultural land (including BMV land)	Agricultural land	Major adverse effect (**significant**)	None	Major adverse effect (**significant)**
Operation – effects on agricultural landholdings	Agricultural landholdings	Minor adverse effect (**not significant**)	None	Minor adverse effect (**not significant**)

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