



**POWER  
FOR GOOD**

# **Chapter 15: Land Use and Agriculture**

Preliminary Environmental Information Report

**Volume 1**

**Steeple Renewables Project**

Land at Sturton le Steeple, Nottinghamshire

## 15. Land Use and Agriculture

### 15.1 Introduction

- 15.1.1 A provisional Agricultural Land Classification (“ALC”) survey was conducted to investigate the ALC grade pertaining to an area of some 722 hectares (ha) for the construction, operation, and decommissioning of a ground mounted solar photovoltaic (“PV”) electricity generation station. **Appendix 1.4 ‘EIA Statement of Expertise’** provides details of the lead author of this Chapter.
- 15.1.2 The Site is located near the village of Sturton le Steeple, south of the West Burton power station site, approximately 10km east of Retford and approximately 700m to the west side of the River Trent.
- 15.1.3 The ALC provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long term limitations on agricultural use. These limitations can operate in one or more of four principal ways: they may affect the range of crops which can be grown; the level of yield; the consistency of yield; and the cost of obtaining it.
- 15.1.4 These factors form the basis for classifying agricultural land into a five-grade system. This system ranks agricultural land from Excellent (ALC Grade 1) to Very Poor (ALC Grade 5) with grade 3 being divided into subgrades 3a and 3b (Good, and Moderate, respectively).
- 15.1.5 This report identifies and quantifies the potential impact of the Proposed Development on the surveyed agricultural resources. The grade (quality) of the agricultural resources and a description of the associated soil resources are reported, along with a description of the proposed use of the agricultural land.

### 15.2 Legislation and Planning Policy

- 15.2.1 In relation to proposed developments for renewable energy, the key National Policy Statements (NPS) to refer to include EN-1 (Overarching National Policy Statement)<sup>1</sup> and EN-3 (National Policy Statement for Renewable Energy Infrastructure)<sup>2</sup>. EN-3

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<sup>1</sup> Department for Energy Security & Net Zero (2023) Overarching National Policy Statement for Energy (EN-1) [online] available at: <https://www.gov.uk/government/publications/overarching-national-policy-statement-for-energy-en-1> [last accessed 8 January 2025].

<sup>2</sup> Department for Energy Security & Net Zero (2023) National Policy Statement for Renewable Energy Infrastructure (EN-3) [online] available at: <https://www.gov.uk/government/publications/national-policy-statement-for-renewable-energy-infrastructure-en-3> [last accessed 8 January 2025].

- notes that, whilst land type should not be a predominating factor in determining the suitability of the Site location, where the use of agricultural land has been shown to be necessary, poorer quality land should be preferred to higher quality land, avoiding the use of Best and Most Versatile land where possible.
- 15.2.2 Paragraph 187 of the National Planning Policy Framework (NPPF)<sup>3</sup> sets out that planning decisions should recognise the economic and other benefits of the Best and Most Versatile (BMV) agricultural land, which equates to ALC Grades 1, 2 & 3a (as defined in NPPF Annex 2). In plan-making, paragraph 188 and Footnote 65 sets out that, where significant development of agricultural land is demonstrated to be necessary, areas of poorer quality land should be preferred, which equates to ALC Grade 3b, 4 and 5.
- 15.2.3 The value of soil as a finite resource is recognised in the HM Government document ‘*Safeguarding our Soils: A Strategy for England*’<sup>4</sup> which seeks to encourage more sustainable and careful management of soil resources. This was also emphasised in the HM Government White Paper ‘*The Natural Choice: securing the value of nature*’<sup>5</sup> and the assessment of the value weighted towards the soil as a resource is outlined in the Institute of Environmental Management and Assessment (IEMA) guidance document<sup>6</sup>.
- 15.2.4 The sustainable use and protection of soil resources is outlined in the guidance document ‘*Construction Code of Practice for the Sustainable Use of Soils on Construction Sites*’<sup>7</sup> which encourages the consideration and protection of soil resources on site during the use and movement of soils throughout the full construction process. In addition, the guidance document from the Institute of

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<sup>3</sup> Ministry of Housing, Communities and Local Government (2024) National Planning Policy Framework [online] available at: <https://www.gov.uk/government/publications/national-planning-policy-framework--2> [last accessed 8 January 2025].

<sup>4</sup> Department for Environment, Food and Rural Affairs (2009) Safeguarding our Soils: A Strategy for England [online] available at: [https://assets.publishing.service.gov.uk/media/65fd6fddf1d3a0001132adb8/CD1.I\\_DEFRA\\_Safeguarding\\_our\\_Soils\\_A\\_Strategy\\_for\\_England.pdf](https://assets.publishing.service.gov.uk/media/65fd6fddf1d3a0001132adb8/CD1.I_DEFRA_Safeguarding_our_Soils_A_Strategy_for_England.pdf) [last accessed 8 January 2025].

<sup>5</sup> HM Government (2011) The Natural Choice: Securing the Value of Nature [online] available at: <https://assets.publishing.service.gov.uk/media/5a7cb8fce5274a38e57565a4/8082.pdf> [last accessed 8 January 2025].

<sup>6</sup> Institute of Environmental Management and Assessment (2022) A New Perspective on Land and Soil in Environmental Impact Assessment [online] available at: [https://www.iema.net/media/3xejdu0u/2022-iema\\_land\\_and\\_soils\\_guidance.pdf](https://www.iema.net/media/3xejdu0u/2022-iema_land_and_soils_guidance.pdf) [last accessed 8 January 2025].

<sup>7</sup> Department for Environment, 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> [last accessed 8 January 2025].

- Quarrying<sup>8</sup> refers the need to produce a Soil Resource and Management Plan to outline appropriate procedures and machinery to use during the construction phase of the Proposed Development and that in the case of BMV land, the land shall be restored to their former capability, ie ALC Grade, at the end of the operational phase of the development.
- 15.2.5 Within the Nottinghamshire County Council (NCC) Minerals Local Plan<sup>9</sup>, Strategic Objective 8 (SO8) and Policy SP5 would indicate that in the case of a proposed minerals development, NCC would be more favourable towards developments on non-BMV land. Policy DM3 also goes on to advise that measures to protect the soil quality during the operational phase of any development should be integrated into the proposals.
- 15.2.6 However, within the Bassetlaw District Council Local Plan<sup>10</sup>, policy ST49: *Renewable Energy Generation* states that renewable energy schemes will be supported in cases where the development siting has considered the location with reference to the best and most versatile agricultural land in the locality.
- 15.2.7 In addition the Aligned Core Strategy<sup>11</sup> Policy 1: Climate Change, refers to the grant towards planning permission for sites for low carbon and renewable energy resources.

### 15.3 Assessment Methodology

- 15.3.1 ALC grading is determined using the Ministry of Agriculture Food and Fisheries (MAFF) ‘*Agricultural Land Classification of England and Wales – Revised guidelines and criteria for grading the quality of agricultural land*’<sup>12</sup> and the Natural England

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<sup>8</sup> The Institute of Quarrying (2021) Good Practice Guide of Handling Soils in Mineral Workings [online] available at: <https://885685.fs1.hubspotusercontent-na1.net/hubfs/885685/Soils%20Guidance/IQ%20Soil%20Guidance%20Part%201.pdf> [last accessed 13 January 2025].

<sup>9</sup> Nottinghamshire County Council (2021) Nottinghamshire Local Plan [online] available at: <https://www.nottinghamshire.gov.uk/planning-and-environment/minerals-local-plan/adopted-minerals-local-plan> [last accessed 8 January 2025].

<sup>10</sup> Bassetlaw District Council (2024) Bassetlaw Local Plan 2020-2038 [online] available at: <https://www.bassetlaw.gov.uk/planning-and-building/bassetlaw-local-plan-2020-2038/bassetlaw-local-plan-2020-2038/> [last accessed 13 January 2025].

<sup>12</sup> Natural England (2015) Agricultural Land Classification of England and Wales: Revised Criteria for Grading the Quality of Agricultural Land, MAFF (October 1988)(ALC011) [online] available at: <https://publications.naturalengland.org.uk/publication/6257050620264448> [last accessed 8 January 2025].

<sup>12</sup> Natural England (2015) Agricultural Land Classification of England and Wales: Revised Criteria for Grading the Quality of Agricultural Land, MAFF (October 1988)(ALC011) [online] available at: <https://publications.naturalengland.org.uk/publication/6257050620264448> [last accessed 8 January 2025].

- (NE) Technical Information Note TIN049 ‘*Agricultural Land Classification: protecting the best and most versatile agricultural land*’<sup>13</sup>.
- 15.3.2 During the undertaking of an ALC Survey, it is essential that the approach aligns with the established standards set out by the MAFF and NE guidance documents.
- 15.3.3 The below **Table 15.1** sets out the comments received as part of the Planning Inspectorate (PINS) Scoping Opinion and how these are addressed in this chapter.

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<sup>13</sup> Natural England (2012) Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land (TIN049) [online] available at: <https://publications.naturalengland.org.uk/publication/35012> [last accessed 8 January 2025].

*Table 15.1: PINS Comments and Responses*

<b>Paragraphs within the EIA Scoping Report (see Appendix 1.1)</b>	<b>Scoping Opinion Comment</b>	<b>How the Comment is Addressed in this PEIR Chapter</b>
<p>Paragraphs 16.2.1 – 16.2.4</p>	<p>The Inspectorate notes that an ALC survey will be carried out within the Proposed Development Site boundary to inform the baseline assessment of BMV agricultural land.</p> <p>The Applicant should ensure that the survey has sufficient coverage across the Proposed Development including the cable route to accurately inform the assessment in line with relevant guidance and/or standards (e.g., Natural England Technical Information Note TIN049, 2012), or justify why an alternative surveying methodology approach is sufficient.</p> <p>The Applicant’s attention is directed to Natural England’s comments on ALC and BMV land included in their response in Appendix 2 of the Scoping Opinion. The ES should demonstrate that the ALC survey has been undertaken by an experienced and qualified surveyor or assessor and that the survey method used is in accordance with relevant guidelines to determine ALC grade and soil quality.</p> <p>The areas of land assessed in the survey should clearly show the classification of each of the areas (e.g., in a table) with justification for the use of the land by grade.</p>	<p>Section 15.3 of this chapter sets out the methodology for the ALC assessment, Section 15.4 outlines survey limitations and assumptions, Section 15.5 confirms that stakeholder engagement will be undertaken and Section 15.6 sets out the findings of the ALC assessment.</p>

Paragraphs within the EIA Scoping Report (see Appendix 1.1)	Scoping Opinion Comment	How the Comment is Addressed in this PEIR Chapter
	<p>The ES should also show regard to the quantity and quality of land that will be temporarily and permanently lost to the Proposed Development and the potential for cumulative impacts at a regional scale with other plans and projects that result in a reduction of available BMV land.</p>	<p>Section 15.7 begins to address impacts of any potential loss of BMV land and Section 15.10 addresses potential cumulative impacts.</p> <p>The assessments will be developed further in the final ES chapter.</p>
	<p>The ES should demonstrate that the mitigation hierarchy has been fully applied, to show that options have been considered to avoid or minimise loss of BMV land and maximise use of poorer quality agricultural land and, where BMV land is required, to provide a clear justification for why this has been necessary.</p>	<p>Section 15.8 outlines the mitigation measures that are being considered at this stage, which will be developed further in the final ES chapter.</p>
	<p>The ES should also show the approach to construction, including any excavation and preservation of topsoil, selection of piling methods and machinery to reduce the impact of compaction, timing (e.g., during drier conditions), and a commitment to applying the relevant codes of practice in relation to soil handling.</p>	<p>Section 15.8 outlines how appropriate soil handling techniques can be implemented during construction works.</p> <p>This will be developed further in the final ES chapter.</p>
	<p>Additionally, the ES should include details of the decommissioning phase including the after use of the Proposed Development, with details relating to proposed methods of returning land to its previous condition with respect to the baseline ALC survey, including an appropriate aftercare programme and opportunities for continued agricultural use and / or grassland management for biodiversity.</p>	<p>Section 15.8 initiates the potential for development of appropriate soil handling techniques. This will be developed further and details will be set out in the subsequent ES chapter.</p>

Paragraphs within the EIA Scoping Report (see Appendix 1.1)	Scoping Opinion Comment	How the Comment is Addressed in this PEIR Chapter
Paragraph 16.3.1	The ES should explain the benefits of grazing sheep at the operational Site and what impacts this may have when considered against the existing land use.	Sections 15.7 and 15.8 begin to consider potential alternative farming practices, which will be developed further in the subsequent ES chapter.
Paragraph 16.3.2	<p>The ES should describe the construction, operation and decommissioning activities and how infrastructure has been located to avoid/minimise impacts of ground disturbance on soil and BMV land.</p> <p>A description of how the Proposed Development’s design components have been selected, and how construction methods and the timing for construction for instance has been determined as part of the assessment of impacts on soil quality should be included in the ES.</p> <p>Impacts should be assessed where significant effects are likely to occur.</p>	<p>The BESS / Substation area comprising part of the Proposed Development is the largest area proposed for ‘permanent’ land sealing within the Proposed Development plan.</p> <p>Any cable corridor routes proposed as part of the Proposed Development will be constructed and maintained using appropriate soil handling measures as outlined in Section 15.8.</p> <p>Further detail will follow in the subsequent ES chapter.</p>
Paragraph 16.5.2	<p>The Scoping Report states that sites smaller than 20ha will not be included within the cumulative assessment as a development of this size would not normally be considered for its impact for loss of agricultural land. Cumulative impacts on BMV land should be assessed at a national and local level.</p> <p>The Inspectorate advises that effort should be made to agree the methodology, study area and approach to the assessment with relevant</p>	To be addressed in subsequent ES chapter.



Paragraphs within the EIA Scoping Report (see Appendix 1.1)	Scoping Opinion Comment	How the Comment is Addressed in this PEIR Chapter
	consultation bodies and would expect the ES to provide clear justification for how the use of this threshold allows cumulative impact to be assessed.	
Section 16.5	The ES should assess the cumulative economic impacts of the Proposed Development alongside other similar NSIP schemes in the area such as Cottam, Gate Burton and Heckington Fen including loss of agricultural land and crop production. Cumulative economic impacts on agricultural businesses and agricultural suppliers should be considered, taking account of relevant guidance from IEMA for example.	To be addressed in subsequent ES chapter.
Paragraph 16.6.1	The ES should include an assessment of the effects on soil resources and soil structure, due to the potential for soils stripping during construction, compaction from construction and decommissioning activity and to identify potential measures for appropriate soil handling and storage, as well as setting out how any potential adverse impacts can be avoided or minimised.	Section 15.8 initiates the potential for development of appropriate soil handling techniques. This will be developed further and details will be set out in the subsequent ES chapter.
Paragraph 16.6.1	The Scoping Report states that an outline Soil Management Strategy will be produced. For clarity this should be provided with the application and detail how this is secured through the DCO.	To be addressed in subsequent ES chapter.
Paragraph 16.6.1	The ES should include a description of all proposed mitigation or compensatory measures and state how these measures will be secured.	To be addressed in subsequent ES chapter.

### Desk Based Reconnaissance

- 15.3.4 The study process begins with a comprehensive desk study to provide reconnaissance of the general Site characteristics, including soil type(s), topographic maps, and climate data to gather preliminary information about the area that may be considered as limiting factors to the Site's ALC Grade. Where available, Post-1988 ALC Surveys (1:5,000 to 1:50,000 scale) are also consulted. Surveys included on this scale provide the most detailed and up to date ALC grading following surveys between 1989 and 1999 by MAFF (now part of DEFRA).

### Field Surveys

- 15.3.5 Field surveys were undertaken between July and September 2024 following the completion of the desk-based assessment. During the Site surveys, land is evaluated using on-site surveying techniques, based on criteria including soil type, topography, and drainage characteristics, with assessments conducted using standard methodologies as set out by the '*Soil Survey Field Handbook – Technical Monograph No.5*<sup>14</sup>, '*Soil Classification for Soil Survey – Monographs on Soil Survey*<sup>15</sup> and the MAFF and NE guidelines.
- 15.3.6 The documents include hand auger borings to a depth of 1.20m, conducted over a sample density of one boring per hectare. In addition to hand augering, at least one inspection pit must be excavated per soil type to determine soil structure. Field observations can additionally be supplemented by soil sampling and laboratory analysis to confirm physical and chemical properties.
- 15.3.7 Only the areas of the Site which are intended to have solar infrastructure installed, i.e., photovoltaic panels, BESS and substation, as part of the Proposed Development have been assessed during the field surveys. All other areas of the Site have been excluded from the in-field survey works, which include areas intended for ecological enhancement areas, cable routes or pre-existing urban areas (including the West Burton Power Station).

### Sensitivity of Receptor

- 15.3.8 There are no legislative requirements governing the assessment of agricultural matters, and the framework of any assessment is derived from national agricultural

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<sup>14</sup> Hodgson, J.M (ed.) (2022) *Soil Survey Field Handbook*, Soil Survey Technical Monograph No.5. Cranfield University.

<sup>15</sup> Butler, B E (1980) *Soil Classification for Soil Survey – Monographs on Soil Survey*. Clarendon Press, Oxford.

and land use policies and measures. For the purpose of this assessment the following sensitivity criteria has been derived from interpretation of the NPPF and MAFF guidance, together with the LA109 guidance<sup>16</sup> and IEMA Guidance is set out in **Table 15.2** below.

*Table 15.2: Criteria for Defining Receptor Sensitivity*

Sensitivity of Receptor	Description	ALC Grade
Very High	Very high agricultural and land use value, quality or rarity on a national scale	Grade 1 and 2 (BMV land)
High	High agricultural and land use value, quality or rarity on a national scale	Grade 3a (BMV Land)
Medium	Medium agricultural and land use value, quality or rarity on a regional scale	Grade 3b
Low	Low agricultural and land use value, quality or rarity on a local scale	Grade 4 and 5
Negligible	Negligible agricultural and land use value and/or land not currently in agricultural rotation with little potential to return to agriculture	Non-Agricultural Land/Urban

### Magnitude of Impact

15.3.9 National policy advises that while land type should not be a predominating factor, land of lower ALC grade (non-BMV) should be preferred where possible. The change of use of BMV land to solar development does have implications on the ability to farm the land for arable uses, however, these effects are not considered to be a permanent loss of land within a wider agricultural use. While the soil is temporarily taken out of arable rotation, the impact on the land is low. Solar projects typically

<sup>16</sup> Highways England (2019) LA 109 Geology and Soils (formerly DMRB Volume 11, Section 3, Part 11 & Part 6), Revision 0 [online] available at: <file:///C:/Users/User/Downloads/LA%20109%20Geology%20and%20soils-web.pdf> [last accessed 8 January 2025].

- involve minimal ground disturbance and can provide a valuable break from intensive agricultural practices associated with arable rotation.
- 15.3.10 This ‘fallow’ (resting) period allows the soil to recover from the constant cultivation, chemical inputs, and compaction associated with modern farming practices. As a result, over the course of the operational life of the Proposed Development (40 years) evidence would suggest that soil health indicators, e.g., organic matter content, soil nutrients, worm count, would improve under grassland, increasing its resilience and capacity for future agricultural use.
- 15.3.11 The IEMA Guide defines impacts as the ‘permanent sealing or land quality downgrading’, noting that temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soils. Solar energy is a temporary and reversible development option that directly supports long-term environmental goals by reducing carbon emissions and contributing to the transition to renewable energy. Farming can continue in the form of grazing. In this context, the temporary use of BMV land for solar panels can be viewed not as a permanent degradation of a valuable resource but as a balanced trade-off for sustainable energy production and soil environment recovery.
- 15.3.12 In addition, the Natural England TIN049 refers to loss of 20ha or more agricultural land being a significant loss and as such, the following significance criteria has been derived for this assessment as set out in **Table 15.3** below.

*Table 15.3: Criteria for Defining Magnitude of Impact*

<b>Soil Resource</b>	<b>Magnitude</b>
The Proposed Development would directly lead to the permanent loss of over 20 ha of BMV land	High
The Proposed Development would directly lead to the permanent loss of between 5 and 20ha of BMV land	Medium
The Proposed Development would directly lead to the permanent loss of less than 5ha of BMV land	Low
The Proposed Development would have no permanent effect on BMV land	Negligible/No Change

15.3.13 The matrix in **Table 15.4.** below indicates how the two considerations are combined and is developed from the guidance provided in document LA 104<sup>17</sup>.

*Table 15.4: Significance Matrix*

		Receptor Sensitivity				
		Very High	High	Medium	Low	Very Low
Magnitude of Impact	High	Major	Major	Major	Moderate	Minor
	Medium	Major	Major	Moderate	Minor	Negligible
	Low	Moderate	Moderate	Minor	Negligible	Negligible
	Negligible	Minor	Minor	Negligible	Negligible	Negligible
	No Change	Neutral	Neutral	Neutral	Neutral	Neutral

15.3.14 The above table takes into account the significance of impact on soil resources in terms of the value of the resource (Receptor) and the reversibility or otherwise (Magnitude) of the potential impacts on this resource, to formulate a measurement of the impact (Significance) and whether this is deemed a Negative or Positive change to the resource.

15.3.15 In the context of the EIA Regulations<sup>18</sup>, Major effects within this Chapter are considered to be significant and Moderate effects are considered likely to be material considerations and ‘Significant’ upon professional judgement. Minor, Negligible and Neutral effects are not considered to be considered in the context of

<sup>17</sup> Highways England (2020) LA 104 Environmental Assessment and Monitoring, formerly HA 205/08, HD 48/08, IAN 125/12, and IAN 133/10 [online] available at: <https://www.standardsforhighways.co.uk/tses/attachments/0f6e0b6a-d08e-4673-8691-cab564d4a60a?inline=true> [last accessed 8 January 2025].

<sup>18</sup> HM Government (2017) The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 [online] available at: <https://www.legislation.gov.uk/uksi/2017/572/contents/made> [last accessed 13 January 2025].

this assessment, Therefore, in the context of this assessment, only Major or Moderate effects will be taken forward for discussion.

## 15.4 Assessment Assumptions and Limitations

### Limitations

- 15.4.1 The Site survey works were not able to be completed across the whole Site due to access constraints for c.30ha of the Site.

### Assumptions

- 15.4.2 The only guidance available to follow is the NE 'trigger value' of 20ha of agricultural land. Given this is such a small amount when compared to the scale of the Site, the key assumptions made in undertaking the assessment of the effects of the Proposed Development on Land Use and Agriculture are that across the great majority of the Site the magnitude of the impact on soil resources is Negligible as the Proposed Development will not permanently seal the ground. Any 'sealing' of agricultural land within the Site will be minimised (and where it is unavoidable, the functional capabilities of the soil will be retained as far as possible within the requirements of the Proposed Development). Furthermore, soil resources disturbed either temporarily or permanently by the Proposed Development will be handled and utilised in a manner which conserves their capabilities, such that these areas can be fully restored to their original ALC grade on decommissioning.
- 15.4.3 The soil survey locations were undertaken at a density of one location per hectare of the Site, in accordance with the NE guidelines. Assumptions have been made for the likely soil type across the Site areas between exploratory hole locations.

## 15.5 Stakeholder Engagement

- 15.5.1 Consultation with relevant stakeholders will be undertaken throughout the Environmental Impact Assessment (EIA) process. The following organisations will be contacted for available information on soil types, quality and agricultural land use:
- Department of the Environment, Food and Rural Affairs (Defra);
  - Natural England;
  - Nottinghamshire County Council; and
  - Bassetlaw District Council.

## 15.6 Baseline Conditions

- 15.6.1 The surveyed Site comprises 722ha of majority agricultural fields which are currently used for a mixture of arable and pastoral farming (based on observations made during the Site visit).
- 15.6.2 The survey Site and ALC reporting area extends to 722 ha and incorporates the areas of the Site which are proposed to have solar infrastructure, i.e., PV panels, BESS and substation constructed as part of the Proposed Development and does not include areas for the cable route, biodiversity or areas designated to be non-agricultural.

### Topography

- 15.6.3 The Site topography ranges between 30 and 35m AOD, with the Site centre average being c.32.5m AOD.

### Climatic Features

- 15.6.4 Using a climatological data set from the Meteorological Office<sup>19</sup>, the Site specific agroclimatic conditions identify that the Site has an average Accumulated Temperature (1392.44 °C), with below Average Annual Rainfall (568.90mm) and Field Capacity Duration (111.20 Days) when compared to the mapped values for the area between Lincoln and Worksop ‘*Soils and their Use in Eastern England*’<sup>20</sup>. The Site is not considered to have any ALC grade limitation due to Climate.

### Flood Risk

- 15.6.5 Some discrete low-lying areas were noted as at high risk of flooding from surface water flooding. Overall, there is a very low risk of flooding from surface waters, rivers, and the sea in the centre and west of the Site. However, the eastern portion of the Site is recorded as being within a Flood Zone 3, therefore there may be some impact on the Site soils due to potential flood risk but would need detailed Site data to be able to downgrade the Site soils due to flood risk.

### Published Geological Data

- 15.6.6 A review of mapped BGS information has identified that no Made Ground areas are indicated across the survey area. However, it is likely that some areas of the Site will

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<sup>19</sup> Natural England (2015) Climatological Data for Agricultural Land Classification (ALC010) [online] available at: <https://publications.naturalengland.org.uk/publication/6493605842649088> [last accessed 8 January 2025].

<sup>20</sup> Soil Survey of England and Wales Bulletin No.13 (1984) Soils and Their Use in Eastern England. Harpenden.

be designated as Made Ground, e.g., the West Burton Power Station site in the northern area of the Site.

- 15.6.7 The eastern section of the Site is indicated as having superficial deposits of the Holme Pierrepont Sand and Gravel Member, with some potential discrete areas of Alluvium (Clay, Silt, Sand and Gravel), particularly encroaching onto the northern and southern Site boundaries. Additionally, there are some localised areas of glaciofluvial and glacial till deposits in the northern area of the Site. The remainder of the Site (west) is indicated to be free from superficial deposits.
- 15.6.8 The bedrock geology is indicated as the Mercia Mudstone Group across the whole Site with localised beds of dolomitic siltstone and/or dolomitic limestone.

#### **Published Soils Data**

- 15.6.9 The soil types mapped on the Site are that of the Worcester, Brockhurst and Blackwood soil associations. A soil association represents a group of soil types which are typically found occurring together in a landscape. These soil associations are described as follows:
- Worcester Association (431) - 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. Slightly at risk of water erosion. The soil profile is described as seasonally waterlogged (Wetness Class III).
  - Brockhurst 2 Association (711c) – Slowly permeable seasonally waterlogged reddish fine loamy over clayey and clayey soils. Some reddish clayey alluvial soils affected by groundwater. The clayey subsoils of this profile are slowly permeable and typically Wetness Class III or IV.
  - Blackwood Association (821b) – Deep permeable sandy and coarse loamy soils. Groundwater controlled by ditches. Where the regional water table has been lowered, the soils are described as well drained (Wetness Class I) or only occasionally waterlogged (Wetness Class II).



### Published ALC Data

- 15.6.10 The ‘*Provisional ALC Mapping*<sup>21</sup>’ available on the MAGIC website (1:250,000 scale) shows the Site to be a provisionally graded as comprising ALC Grade 3 land. This mapping does not, however, distinguish between Sub-grades 3a and 3b.
- 15.6.11 No post-1988 detailed ALC survey<sup>22</sup> data is available for the Site and/or surrounding areas.

### Soil Characteristics and Agricultural Land Classification

- 15.6.12 Soils present across the Site fall within one of four general Soil Types as defined by REL, with a breakdown of each of the typical Soil Types shown in **Table 15.5** below.

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<sup>21</sup> Natural England (2024) Provisional Agricultural Land Classification (ALC) [online] available at: <https://magic.defra.gov.uk/MagicMap.aspx> [last accessed 8 January 2025].

<sup>22</sup> Natural England (2024) Agricultural Land Classification (ALC) Grades – Post 1988 Survey (polygons) [online] available at: <https://www.data.gov.uk/dataset/c002ceea-d650-4408-b302-939e9b88eb0b/agricultural-land-classification-alc-grades-post-1988-survey-polygons> [last accessed 8 January 2025].

*Table 15.5: Summary of Soil Types Identified on Site*

	<b>Depth (cm)</b>	<b>Texture</b>	<b>Munsell Colour</b>	<b>Stones (%)</b>	<b>Mottles</b>	<b>Structure</b>
<b>Soil Type 1</b>	0-20	Heavy Silty Clay Loam (HZCL)	Dark Brown (7.5YR 3/4)	5	No	Subangular Blocky
	20-120	Silty Clay (ZC)	Reddish Brown (5YR 4/4)	15	Many Medium Grey (GLEY 2 7/1 5B) and Ochreous (10YR 6/8)	Coarse Prismatic
<b>Soil Type 2</b>	0-42	Heavy Clay Loam (HCL)	Dark Brown (10YR 3/3)	5	No	Subangular Blocky
	42-120	Clay (C)	Dark reddish Brown (5YR 3/4)	5	Few Ochreous (7.5YR 5/8)	Coarse Prismatic
<b>Soil Type 3</b>	0-34	Heavy Silty Clay Loam (HZCL)	Dark Brown (7.5 YR 3/3)	5	No	Subangular Blocky
	34-90	Clay (C)	Dark Yellowish Brown (10YR 4/4)	5	No	Subangular Blocky
	90-120	Fine Sand (fS)	Pale Olive (5Y 6/4)	5	No	Single Grain
<b>Soil Type 4</b>	0-39	Fine Sandy Silt Loam (fSZL)	Dark Brown (7.5YR 3/3)	5	No	Subangular Blocky
	39-120	Fine Sand (fS)	Strong Brown (7.5YR 4/6)	5	No	Single Grain

#### Soil Type 1

- 15.6.13 Comprised mainly heavy silty clay loam topsoil to typically 20cm with subangular blocky structure. Subsoil was regularly observed as silty clay with a coarse prismatic, defining the Slowly Permeable Layer at 20cm depth. These profiles were assessed as Wetness Class III and are predominantly limited in their agricultural capability by wetness, resulting in ALC Grade 3b for this Soil Type.

#### Soil Type 2

- 15.6.14 Typically identified as heavy clay loam topsoil to an average depth of 42cm with subangular blocky structure. Subsoil was typically observed as a coarse prismatic clay, resulting a Slowly Permeable Layer assessed at 42cm. This profile was assessed as Wetness Class II and was limited to ALC Grade 3a due to soil wetness limitations.

#### Soil Type 3

- 15.6.15 Soil Type 3 was identified with variable characteristics, but typically having a heavy silty clay loam topsoil of an average 34cm thickness and a subangular blocky structure. The initial subsoil was identified as a subangular blocky clay, which further developed into a well-drained fine sand of single grain structure at 90cm. Soil Type 3 was determined to be well drained (Wetness Class I) which resulted in ALC Grade 2 due to both droughtiness and wetness limitations on this soil type.

#### Soil Type 4

- 15.6.16 Typically encountered as a freely draining fine sandy silt loam topsoil of average 39cm thickness, underlain by a fine sand of single grain structure. This soil type was defined as well drained (Wetness Class I) with no limitations relating to the soil physical characteristics.
- 15.6.17 The agricultural land within the Site has provisionally been classified as comprising a mix a BMV and non-BMV land. The main limitation to their quality of the land in these grades is due to soil wetness where slowly permeable clay horizons in the soil profile impede drainage. There are also some limitations due to soil droughtiness where soil texture and stone content restrict profile water availability.

## 15.7 Assessment of Likely Significant Effects

- 15.7.1 Of the land surveyed, approximately 12% of the land has been provisionally classified as ALC Grade 3b (non-BMV land), 6% designated ALC Grade 1, 21% ALC Grade 2 and the remaining 61% ALC Grade 3a. The provisional ALC results are

- presented at **Figure 15.1 'ALC Grades Map'**. The Proposed Development will not result in permanent sealing or downgrading of BMV land. Consequently, the Proposed Development will not result in the permanent loss of BMV land as the vast majority of BMV land would not be 'sealed', i.e., removed from agricultural use without mitigation. Construction phase impacts will be limited, subject to soil management practices described in the Mitigation section below and will not result in any significant temporary or permanent downgrading or loss of land quality.
- 15.7.2 Internal areas of the Site that will be affected by fixed infrastructure will be affected temporarily, albeit for the duration of the operational phase, but can be fully restored to the original ALC grade on decommissioning.
- 15.7.3 The vast majority of agricultural land across the Site will not be removed from agricultural use during the operational phase of the Proposed Development, with alternative farming methods implemented such as grazing land. It is anticipated that removing the land from arable rotation to be under grassland for a 'resting' period would lead to some improvements in soil factors. These changes to the Site usage as a result of the Proposed Development will be further discussed in the subsequent ES chapter.
- 15.7.4 It is also important to note that the construction processes associated with installation of solar panels will lead to the retention of most of the soil resources on the Site as minimal ground disturbance is required to construct a solar array site.
- 15.7.5 Any temporary sealing of agricultural land as a result of the Proposed Development is confined to the lowest grade BMV land (ALC Grade 3a) across the Site . It should be noted that this area of land will not be permanent and shall be restored at the end of the operational phase of the Proposed Development. A Major temporary significant effect (for the lifetime of the Proposed Development) is therefore anticipated at this stage and further detail will follow in the subsequent ES when the design of the Proposed Development has been refined and a detailed layout is available to assess.
- 15.7.6 In addition, any elements of the Proposed Development which are to remain following the decommissioning phase will total <20ha, i.e., less than the 20ha Natural England trigger value and as such would not result in a significant effect.

## 15.8 Mitigation and Enhancement

- 15.8.1 The relevant policies listed above reference the need for good practices that focus on the sustainable management of soil resources. Although the agricultural soils present on the Site have been provisionally classified as a mixture of BMV and non-BMV land, all soils will contribute positively to the landscaping efforts of the Proposed Development, such as for landscaping/screening, or will be restored to agricultural use on decommissioning of the Proposed Development. These measures will be outlined further in the ES Chapter.
- 15.8.2 It is anticipated that during the operational phase of the Proposed Development the land will be made available for grazing, under grassland, therefore not removed from agricultural use.
- 15.8.3 An evaluative point to additionally consider is that should the soils experience disturbances during the construction process, these are only temporary; any losses in land drainage, climate regulation and other environmental functions can be restored at the completion of construction works by the correct storage and reinstatement of the soils.
- 15.8.4 In addition, impacts would be reduced by mitigation measures embedded into the design of the Proposed Development, such as best practice for soil handling, seed mixes for stockpiles and use of appropriate task-specific equipment, as well as by additional mitigation, and together these measures would act to avoid, reduce and mitigate effects.
- 15.8.5 The above protection measures will include production of documents advising the best practice for soil handling on sites such as a Construction Environmental Management Plan (CEMP) and/or outline Soil Management Plan (oSMP) for the Proposed Development.
- 15.8.6 In addition, for areas which will be subject to sealing, any permanent impacts on land quality will be avoided through the use of an outline Soil Resource Management Plan (oSRRMP). An oSRMP is currently being developed, which sets out the soil survey work needed once the design of the cable route has been finalised, together with any actions from the CEMP and/or oSMP.

## 15.9 Residual Effects

- 15.9.1 The installation of photovoltaic panels may have both positive and negative residual effects on the health of soil during the operational phase of the Proposed Development. To leave the soil 'fallow' during the operational phase of the Proposed Development would mean that it is protected from the repetitive disturbances associated with farming machinery and chemical applications which lead to erosion and degradation of the soil. The operational phase of the Proposed Development would allow the soil to undergo a period of recovery, potentially improving its structure and drainage characteristics, organic matter content, soil nutrient balance (without the requirement for application of fertilisers) as well as its resilience to future agricultural use.
- 15.9.2 The operational phase of the Proposed Development would lead to the change of agricultural enterprise from what is currently mostly arable production to a grassland-based agricultural enterprise. This would therefore remain an agricultural use, which would be considered to be of Negligible impact on the land and soil resource.
- 15.9.3 The construction and operational phase of the Proposed Development would affect up to c.50ha of agricultural land in terms of temporary disturbance for fixed infrastructure etc. This would be considered to be a temporary and reversible impact of High magnitude (**Table 15.3**) on a High sensitivity receptor in relation to the loss of BMV land (ALC Grade 3a) (**Table 15.2**). This would be deemed an effect of Major adverse significance (**Table 15.4**) during the operational phase of the Proposed Development, which would be temporary and reversible.
- 15.9.4 Although land would be lost from arable rotation during the operational phase of the Proposed Development, this would not result in the loss of land from agricultural production and the impact on the agricultural enterprise. There would be potential for diversification of the business and use of the land, e.g., grazing, Biodiversity Net Gain, differing crop rotations.

## 15.10 Cumulative and In-Combination Effects

### Cumulative Effects of Local Developments

- 15.10.1 The following schemes are considered as being appropriate for inclusion in the assessment of cumulative effects, with reasons provided as shown in **Table 15.6**

below. The below cumulative schemes have been selected as they are located on agricultural land.

Table 15.6: List of Cumulative Schemes for Consideration

Description of Proposed Development	Planning Phase	Distance from Site	Reason for Consideration in Cumulative Assessment
Cottam Solar - NSIP development comprising three electricity generating stations, each with anticipated capacity in excess of 50MW, comprising of ground mounted solar arrays, with associated development comprising energy storage, grid connection infrastructure and other infrastructure integral to the construction, operation, and maintenance of the NSIPs	Granted	Approximately 8m east	Development of agricultural (greenfield) land for solar array within 20km of the Site
North Humber to High Marnham – NSIP developing comprising the reinforcement of the 400kV high voltage power network between North Humber and High Marnham.	Pre-App	Nearest adjacent to northwest boundary	Proposed upgrading of electricity network resulting in soils disturbance within 20km of the Site
Gate Burton Energy Park - The Scheme comprises the installation of solar PV generating panels and on-site energy storage facilities and grid connection infrastructure. The Scheme would allow for the generation, storage and export of up to 500 (MW) electrical generation capacity.	Granted	Approximately 10km east	Development of agricultural (greenfield) land for solar array within 20km of the Site
Great North Road Solar Park - Solar photovoltaic array generating station, battery energy storage system and grid connection infrastructure, with a maximum generation capacity of 800MW.	Pre-App	Approximately 20km south	Development of agricultural (greenfield) land for solar array within 20km of the Site

<b>Description of Proposed Development</b>	<b>Planning Phase</b>	<b>Distance from Site</b>	<b>Reason for Consideration in Cumulative Assessment</b>
<p>Tillbridge Solar Project - Generating station with an anticipated capacity in excess of 50MW, comprising ground mounted solar arrays, with associated development comprising energy storage, grid connection infrastructure and other associated development for the construction, operation, maintenance and decommissioning of the solar farm.</p>	<p>Under consideration</p>	<p>Approximately 9.5km northeast</p>	<p>Development of agricultural (greenfield) land for solar array within 20km of the Site</p>
<p>West Burton Solar Project - NSIP development comprising four electricity generating stations, each with anticipated capacity in excess of 50MW, comprising of ground mounted solar arrays, with associated development comprising energy storage, grid connection infrastructure and other infrastructure integral to the construction, operation, and maintenance of the NSIPs.</p>	<p>Under consideration</p>	<p>Approximately 8km southeast</p>	<p>Development of agricultural (greenfield) land for solar array within 20km of the Site</p>
<p>One Earth Solar Farm – comprising a solar farm and collated BESS allowing for the generation, export and storage of electricity exceeding 50 MW. The project includes a solar PV array electricity generating facility and BESS including PV modules and mounting structures, inverters, transformers and switchgears, on-site substations and underground cabling.</p>	<p>Pre-App</p>	<p>Approximately 20km southeast</p>	<p>Development of agricultural (greenfield) land for solar array within 20km of the Site</p>
<p>Tarmac (now Aggregate Industries) consented quarry located adjacent to the northeastern boundary of the Site.</p>	<p>Granted</p>	<p>Adjacent to northeast boundary</p>	<p>Development of agricultural (greenfield) land for quarry and loss of</p>



Description of Proposed Development	Planning Phase	Distance from Site	Reason for Consideration in Cumulative Assessment
			agricultural land within 20km of the Site

15.10.2 In addition to the short list of schemes given above, a cumulative assessment of the impacts will be detailed in the subsequent Environmental Statement (ES) chapter.

### Cumulative Effects of Loss of BMV Land

15.10.3 The cumulative loss of BMV land as a result of the Proposed Development and the above similar nearby proposals identified represents a potential effect of Moderate to Major adverse significance due to the limited permanent loss of any BMV land (<20ha) when compared to the NE trigger value of 20ha of permanent loss. However, detailed ALC data is not available for all the land surrounding the Site and within the other Proposed Development areas.

15.10.4 The overall losses of agricultural land of BMV quality should be viewed in the context that this area of the country comprises a mixture of ALC Grade 2 and ALC Grade 3 on the available provisional mapping and that detailed surveys in the area would indicate a mixture of ALC Grade 3a and 3b, therefore it is highly likely that the surrounding land has equally large areas of BMV land. Consequently, it would be difficult to find large development opportunities which wholly avoid development on agricultural land, including BMV land. The use of this land is therefore consistent with the objective of national land use policy for the benefit of renewable energy infrastructure, where the use of the highest grade agricultural land is avoided when practicable.

## 15.11 Summary

15.11.1 A total 722 ha of land was surveyed as part of the ALC assessment (see **Figure 15.1: ALC Grades Map**). The main receptors of effects arising from the Proposed Development are the soil resources present on the Site and the agricultural land capability they support. Assessment of the potential impact on the yields gained/lost from the Site as a result of the Proposed Development will be assessed in the subsequent ES chapter.

- 15.11.2 The Proposed Development seeks to minimise the adverse effects of construction and changes of land use on the soil and agricultural land resources by the prudent use of land in the planning and design process, and by the adoption of recognised best practice in the handling of soils and construction methods generally.
- 15.11.3 Within those areas identified for associated infrastructure (i.e., BESS / substation area), there will be some permanent disturbance of the soil resources. However, these areas directly relate to areas identified as having the lowest BMV value soils in terms of their use for agriculture (i.e., ALC Grade 3a) and will only relate to the potential permanent loss of less than 20ha of land. In addition, the resources will be conserved and largely redeployed in the design of those areas and adjacent areas, where some of their environmental functions will be retained. The residual effect will therefore be Moderate to Major adverse and potentially Minor beneficial should the soils be reused elsewhere on the Proposed Development.
- 15.11.4 The majority of the Site has been provisionally assessed as being of BMV agricultural quality. This is a sensitive receptor, the scale of ‘permanent’ loss, i.e, sealing of land, is medium (<20ha), and the residual effect is Major adverse for the lifetime of the Proposed Development only. Further detail will follow in the subsequent ES when the design has been refined and a detailed layout is available to assess. There will be only limited disturbance to the natural soil resources which will continue to perform their existing environmental functions. Although arable agricultural rotation will be displaced from the proposed solar array areas, the inherent productive capabilities will be largely retained against potential future requirement. The immediate loss of access to that capability involves land of BMV quality, but the loss is countered by the increased ability of the soils to sustain and enhance biodiversity interests within the wider Proposed Development area which is a beneficial effect.
- 15.11.5 Any impacts during the construction / operational / decommissioning phases will be assessed within the subsequent ES chapter and any measures which are required will also be outlined.

Table 15.7: Summary and Residual Effects

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
<b>Construction</b>								
BMV land / Non BMV Land within the Site	Construction processes associated with installing solar panels	Temporary (see 15.7.4)	High	Negligible	National	Minor Adverse	CEMP / oSMP	Negligible
<b>Operation</b>								
BMV land	Loss of ALC Grade 1, 2 or 3a land	Permanent (see 15.7.6)	High	Low	National	Slight or Moderate Adverse	oSRMP Land is to be taken out of agricultural rotation for the duration of the Proposed Development	Slight or Moderate Adverse
BMV land	Loss of ALC Grade 1, 2 or 3a land	Temporary (see 15.7.5)	High	Negligible	National	Major Adverse (for the lifetime of the	oSRMP Land is to be taken out of	Major Adverse (for the lifetime of the

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
						Proposed Development)	agricultural rotation for the duration of the Proposed Development	Proposed Development - see Paragraph 15.9.3). Further assessment will follow within the ES when a detailed layout is available to assess.
Non-BMV land / soil resources	Loss of ALC Grade 3b land	Temporary	Negligible	Negligible	Regional	Negligible	Not applicable	No change (see Paragraph 15.9.4)
<b>Cumulative and In Combination</b>								
BMV land	Loss of ALC Grade 1, 2 or 3a land	Permanent (see 15.10.3- 15.10.4)	High	Low	National	Slight or Moderate Adverse	Land is to be taken out of agricultural rotation for the duration of the	Slight or Moderate Adverse

Receptor/ Receiving Environment	Description of Effect	Nature of Effect	Sensitivity Value	Magnitude of Effect	Geographical Importance	Significance of Effects	Mitigation/ Enhancement Measures	Residual Effects
							Proposed Development	
BMV land	Loss of ALC Grade 1, 2 or 3a land	Temporary  (see 15.10.3- 15.10.4)	High	No change	National	Neutral	Land is to be returned to agricultural rotation at the end of the operational phase of the Proposed Development	Neutral
Non-BMV land / soil resources	Loss of ALC Grade 3b land	Temporary  (see 15.10.3- 15. 10. 4)	Negligible	Negligible	Regional	Negligible	Not applicable	No change