

Springwell Solar Farm

Preliminary Environmental Information Report

Volume 1
Chapter 10: Land, Soils and Groundwater

Phase 2 consultation
Springwell Energyfarm Ltd



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10. Land, Soils and Groundwater

10.1. Introduction

- 10.1.1. This chapter presents the preliminary environmental information and a preliminary assessment of the likely significant environmental effects arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development upon land, soils and groundwater.
- 10.1.2. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR) with particular reference to **Chapter 13: Water** alongside the following figure presented in **Volume 2** and appendices in **Volume 3**.
- **Figure 10.1** - Agricultural Land Classification
 - **Appendix 10.1** - Preliminary Risk Assessment
- 10.1.3. Regarding agricultural land, the Agricultural Land Classification (ALC) system (MAFF, 1988) classifies land into five grades numbered 1 to 5, with grade 3 divided into two subgrades (3a and 3b). The ALC system provides a framework for classifying land according to the extent to which its physical or chemical characteristics impose long-term limitations on agricultural use for food production. The 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 crop yield, the consistency of crop yield, and the cost of obtaining a crop. The classification system gives considerable weight to flexibility of cropping, whether actual or potential, however the ability of some land to produce consistently high yields of a narrower range of crops is also considered.

10.2. Consultation, scope and study area

Consultation undertaken to date

- 10.2.1. An EIA Scoping Report, as provided in **Appendix 4.1**, setting out the proposed land, soils and groundwater assessment scope and methodology for the Proposed Development, was submitted to the Planning Inspectorate in March 2023. A Scoping Opinion, as provided in **Appendix 4.2**, was issued by the Planning Inspectorate on behalf of the Secretary of State in May 2023. **Appendix 4.3** provides responses to comments relating to land, soils and groundwater in the Scoping Opinion and details how these have been addressed in this preliminary assessment.
- 10.2.2. **Table 10.1** provides a summary of the consultation activities undertaken in support of the preparation of this preliminary assessment, out with the EIA Scoping process.

Table 10.1 Summary of consultation undertaken

Consultee	Key matters raised	Actions in response to consultee comments
Natural England	<p>Meeting was held on 11th September 2023 to discuss the agricultural land classification survey and the consideration of BMV land in the development of the design.</p> <p>Natural England requested for an agricultural land classification survey to be undertaken of the proposed cable route locations connecting each parcel to help inform the management requirements of the soil which will be documented within and secured by the Outline Soil Management Plan.</p>	<p>Agricultural land classification survey to be undertaken of the proposed cable route location between each parcel.</p> <p>It was agreed to make the survey work as targeted as possible and to undertake the survey once the preferred cable route between the parcels is known. It is expected that the cable route survey and further engagement with Natural England in relation to the Outline Soil Management Plan will be undertaken prior to the submission of the DCO application. Once the preferred cable route is known, the soils will be surveyed at those locations to inform the soil management during construction.</p>

10.2.3. Further consultation will be undertaken with North Kesteven District Council and Lincolnshire County Council prior to undertaking the ES.

Scope of the assessment

10.2.4. This section updates the scope of assessment and confirms, and where necessary updates, the evidence base for scoping out receptors/matters following further iterative assessment and consideration of the Scoping Opinion.

Receptors/matters scoped out of further assessment

10.2.5. **Table 10.2** presents the receptors/matters that are scoped out of further assessment, together with appropriate justification. Where a change has occurred to the approach proposed within the EIA Scoping Report, this is clearly stated and justified.

Table 10.2 Receptor/matters scoped out of further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Soils (impacts from compaction)	Operation	Potential for vehicle movements to cause compaction is considered limited.	No change – this matter was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach. However, consideration should be afforded towards how agricultural land use would be continued and an understanding of changes to the hydrogeological regime. The Applicant can confirm that this will be dealt with within the Outline Soil Management Plan which will be submitted in support of the DCO application.
Soils	Decommissioning	Vehicle movements will be less extensive than during the construction phase, limiting potential for compaction of soils. Also, lower likelihood of adverse impact on agricultural field drains.	No change – this matter was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Unexploded Ordnance	Construction	Detailed Unexploded Ordnance (UXO) Risk Assessment has been undertaken for the Site and deemed the majority of the Site as being at a Low Risk from items of allied UXO. The risk of UXO will be managed by the	No change – this matter was proposed to be scoped out of further assessment within the EIA Scoping Report but the Scoping Opinion has requested it be scoped in. However, the Applicant is of the opinion that this matter should remain scoped out of

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		implementation of a UXO Risk Management Plan for intrusive works and site-specific awareness briefings, alongside, attendance by a UXO specialist on-site support for intrusive works in areas of medium risk.	further assessment for the reasons outlined in the 'Justification' column.

Receptors/matters scoped into further assessment

10.2.6. **Table 10.3** presents the receptors/matters that are scoped into further assessment, together with appropriate justification. Where a change has occurred to the approach proposed within the EIA Scoping Report, this is clearly stated and justified.

Table 10.3 Receptor/matters scoped into further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Land contamination and minerals	Construction, operation and decommissioning	The Scoping Opinion requested this matter be scoped in. A Minerals assessment has been requested to be undertaken to inform and influence the design and layout to demonstrate how impacts to Mineral Safeguarding Areas have been addressed. A Mineral Safeguarding Assessment will be undertaken to inform the design and will form part of the Planning Statement submitted in support of the DCO application. Consultation with the	Change - this matter was proposed to be scoped out of further assessment within the EIA Scoping Report but the Scoping Opinion has requested it be scoped in. Following further consideration, the Applicant agrees with this opinion for the purposes of this preliminary assessment.

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		Minerals Authority is ongoing. Preliminary Risk Appraisal has been undertaken and is provided in Appendix 10.1 .	
Groundwater	Construction, operation and decommissioning	The Scoping Opinion requested this matter be scoped in.	Change - this matter was proposed to be scoped out of further assessment within the EIA Scoping Report but the Scoping Opinion has requested it be scoped in. Following further consideration, the Applicant agrees with this opinion for the purposes of this preliminary assessment.
Soils (soils and agricultural land)	Construction	Impacts on availability of BMV land, topsoil quality, impacts due to changes to the hydrogeological regime and impacts due to damage to agricultural field drains.	No change – this matter was proposed to be scoped into further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Agricultural land	Operation	The Proposed Development will be located on agricultural land and will therefore impact the availability of agricultural land during operation of the Proposed Development.	No change – this matter was proposed to be scoped into further assessment within the EIA Scoping Report and the Scoping Opinion has

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Report	to the in the Scoping Report
			agreed with this approach.	
Agricultural land	Decommissioning	The solar panels and associated infrastructure would be removed during decommissioning and therefore that land will be returned to the landowner in a state suitable for continued agricultural use.	No change – this matter was proposed to be scoped into further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.	

Extent of the study area

- 10.2.7. As proposed in the EIA Scoping Report, for the purposes of this preliminary assessment, the Site and a 1km buffer have been considered with regard to identifying land, soil and groundwater related receptors that could be impacted by the construction, operation and/or decommissioning of the Proposed Development.
- 10.2.8. The Site boundary and parameters detailed in **Figures 2.2 and 2.3** show the land upon which the assessment detailed within this chapter has been undertaken.

10.3. Legislative framework, planning policy and guidance

Relevant legislation

- 10.3.1. The legislative framework relevant to land, soil and groundwater comprises the following:
 - Part IIA of the Environmental Protection Act 1990;
 - The Water Resources Act 1991 (Amendment) (England and Wales) Regulations 2009;
 - The Water Framework Directive 2000/60/EC;
 - The 1980 Groundwater Directive 80/68/EEC;
 - The Priority Substances Directive 2008/105/EC; and
 - The Environmental Permitting (England and Wales) Regulations 2016.

Relevant planning policy

10.3.2. Planning policy relevant to land, soil and groundwater comprises the following:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)¹ provides the basis for decisions regarding nationally significant energy infrastructure. Section 5.10 refers to land use, including a need to seek to minimise impacts on BMV agricultural land, and to seek to minimise impacts on soil quality. Section 5.15 refers to assessment of impacts on water quality and resources.
- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)² - Section 5.11 refers to land use, including a need to seek to minimise impacts on BMV agricultural land, and to seek to minimise impacts on soil health and protect and improve soil quality. Section 5.16 refers to assessment of impacts on water quality and resources.
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)³ - There are no specific policies relevant to the land use for solar; however, further detail is provided in the Draft NPS EN-3 as noted below.
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)⁴ - Section 3.10 gives specific consideration to solar development including assessment of impacts on agricultural land. Paragraph 3.10.15 states that *'whilst the development of ground mounted solar arrays is not prohibited on agricultural land classified 1, 2 and 3a, or sites designated for their natural beauty, or recognised for ecological or archaeological importance, the impacts of such are expected to be considered..'* Paragraph 3.10.17 states that where sited on agricultural land, consideration may be given as to whether the proposal allows for continued agricultural use and/or can be co-located with other functions (for example, onshore wind generation, or storage) to maximise the efficiency of land use.

¹ Overarching National Policy Statement for Energy (EN-1) (2011). Available online:

<https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>

² Draft National Policy Statement for Energy (EN-1) (2023). Available online:

<https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements>

³ National Policy Statement for Renewable Energy (EN-3) (2011). Available online:

<https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure>

⁴ Draft National Policy Statement for Renewable Energy (EN-3) (2023). Available online:

<https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements>

- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)⁵ (2011) – Paragraph 1.7.5 and 2.8.9 refers to underground cabling effects on soil and water.
- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)⁶ (2023) – Paragraph 2.11.14 refers to the requirement to mitigate effects of any undergrounding works on any relevant agricultural land and soils, particularly Best and Most Versatile Land and states that “*Such a commitment much guarantee appropriate handling of soil, backfilling, and return of the land to the baseline Agricultural Land Classification (ALC), thus ensuring no loss or degradation of agricultural land*”.
- National Planning Policy Framework (NPPF) (September 2023)⁷, including paragraph 174.
- Central Lincolnshire Local Plan 2018-2040⁸, including Policy S14: Renewable Energy (in so far as it includes reference to heritage assets), Policy S67 Best and Most Versatile Land: and Policy S60: Protecting Biodiversity and Geodiversity.
- Lincolnshire Minerals and Waste Local Plan, Core Strategy and Development Management Policies (2016)⁹, identifies policies on waste and minerals, of particular interest, Policy M11 Safeguarding of Mineral Resources.
- A Green Future: Our 25 Year Plan to Improve the Environment sets out the government’s 25-year plan to improve the health of the environment by using natural resources more sustainably and efficiently¹⁰.

Applicable guidance

10.3.3. The following guidance documents have been used during the preparation of this preliminary assessment:

- Land Contamination Risk Management (LCRM) (Environment Agency, 2023)¹¹.
- Ministry of Agriculture, Fisheries and Food (MAFF), (1988). Agricultural Land Classification for England and Wales:

⁵ National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011). Available online: [1942-national-policy-statement-electricity-networks.pdf \(publishing.service.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/1942-national-policy-statement-electricity-networks.pdf)

⁶ Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023). Available online: [EN-5 Electricity Networks National Policy Statement \(publishing.service.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/114223/EN-5_Electricity_Networks_National_Policy_Statement.pdf)

⁷ National Planning Policy Framework (2023). Available online: <https://www.gov.uk/government/publications/national-planning-policy-framework--2>

⁸ <https://www.n-kesteven.gov.uk/planning-building/planning/planning-policy/central-lincolnshire-local-plan-2018-2040>

⁹ LLincolnshire Minerals and Waste Local Plan, Core Strategy and Development Management Policies (2016). Available online: [Minerals and waste – Lincolnshire County Council](https://www.lincolnshire.gov.uk/media/10000/Minerals_and_waste_-_Lincolnshire_County_Council.pdf)

¹⁰ UK Parliament. A Green Future: Our 25 year plan to improve the environment. Available online: [25-year environment plan - House of Commons Library \(parliament.uk\)](https://www.parliament.uk/resources/25-year-environment-plan/)

¹¹ Environment Agency. Land Contamination Risk Management (2023). Available online: [Phase 1 desktop study contamination survey and investigation services \(wessonenvironmental.co.uk\)](https://www.environmental.gov.uk/phase-1-desktop-study-contamination-survey-and-investigation-services/)

Revised Guidelines and Criteria for Grading the Quality of Agricultural Land¹²

- Institute of Environmental Management & Assessment (IEMA) Guide: A New perspective on Land and Soil in Environmental Impact Assessment (2022)¹³
- Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile agricultural land, 2nd edition (2012)¹⁴.

10.4. Methodology

Data sources to inform baseline characterisation

10.4.1. The following information has been reviewed to inform the preliminary baseline assessment:

- MAGIC map¹⁵— online interactive maps providing environmental mapping data from partners including; Department for Environment, Food and Rural Affairs, Historic England, Natural England, Environment Agency, Forestry Commission and Marine Management Organisation.
- British Geological Survey – Geology of Britain online viewer¹⁶. Website provides geological mapping data and copies of scanned historical borehole logs (where available).
- Agricultural Land Classification Map East Midlands Region (ALC005)¹⁷.

Surveys to inform baseline characterisation

10.4.2. A Preliminary Risk Assessment report was undertaken on behalf of the Applicant in 2022 to assess potential land contamination sources and geotechnical constraints to the Proposed Development. The Preliminary Risk Assessment report is provided in **Appendix 10.1** and is referenced in further detail below.

¹² Natural England, formerly Ministry of Agricultural, Fisheries and Food (MAFF). Agricultural Land Classification of England and Wales: Revised criteria for grading the quality of agricultural land (ALC011) (1988). Available online: [Land Registry UK - Access Land Registry Title Documents Online](#)

¹³ Institute of Environmental Management & Assessment (IEMA) Guide: A New Perspective on Land and Soil in Environmental Impact Assessment (2022). Available online: [IEMA publishes new land and soils guidance - IEMA](#)

¹⁴ Natural England, Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile agricultural land. 2nd Edition (2012). Available online: [Agricultural Land Classification: protecting the best and most versatile agricultural land - TIN049 \(naturalengland.org.uk\)](#)

¹⁵ Department for Environment, Food and Rural Affairs. MAGIC map (2023). Available online: [Magic Map Application \(defra.gov.uk\)](#)

¹⁶ British Geological Survey. Geology Viewer (2023). Available online: [BGS Geology Viewer - British Geological Survey](#)

¹⁷ Natural England. Agricultural Land Classification Map: East Midlands Region (ALC005). Available online: [Agricultural Land Classification Map East Midlands Region - ALC005 \(naturalengland.org.uk\)](#)

- 10.4.3. An ALC survey was undertaken on behalf of the Applicant in November 2022 based on observations at intersects of a 200m grid, giving a sampling density of one observation per four hectares. Later during Spring 2023, further observations were conducted at 100m spacing, giving a final sample density of one per hectare. The survey was undertaken in line with the Natural England 'Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile land', 2nd edition (2012).
- 10.4.4. During the survey, soils were examined via a combination of auger borings and soil description pits to a maximum depth of 1.2m. A number of mini pits were also dug ad hoc to confirm soils and stone content, from which it has been possible to map the distribution of land quality and soil types. The results of the ALC survey are displayed in **Figure 10.1** provided in **Volume 2** and are referenced in further detail below.
- 10.4.5. An ALC survey will be undertaken of the underground cable routes that would connect the Solar PV development to the Springwell Substation and of the Grid Connection Corridor once the location of the cable routes has been refined. The outputs of the survey will inform the ES and the Outline Soils Management Plan.

Design assumptions

- 10.4.6. **Chapter 2: Description of the Proposed Development** details the preliminary design principles of the Proposed Development components as they are currently known. Preliminary parameter plans, which define the broad extents within which development can take place, are presented in the following figures within **Volume 2**:
- **Figure 2.3** – Zonal Masterplan;
 - **Figure 2.4** – Indicative Height Parameters Plan;
 - **Figure 2.5** – Indicative Green Infrastructure Parameters Plan; and
 - **Figure 2.6** – Indicative Operational Access & Movement Parameters Plan.
- 10.4.7. The design principles and parameters that have been applied in relation to land, soil and groundwater are as set out in **Chapter 2: Description of the Proposed Development**.
- 10.4.8. **Chapter 4: Approach to EIA** sets out those elements of the Proposed Development for which optionality is present within the current design and sets out the scenario assessed for the purpose of this PEIR.

Embedded mitigation measures

- 10.4.9. This preliminary assessment has been based on the principle that measures have been 'embedded' into the design of the Proposed Development to remove potential significant effects as far as

practicable, for example by the considered placement of infrastructure.

- 10.4.10. As detailed in **Chapter 3: Reasonable Alternative Considered**, the Site selected has taken into consideration the ALC profile of the land. The Site was identified as predominantly Grade 3 on the provisional Defra mapping, offering the potential for Grade 3b land subject to further survey, with areas of Grade 2. This was also supplemented by initial conversations with the landowners over the quality and viability of the Site for agriculture.
- 10.4.11. Following further analysis and surveys, some additional Grade 1 and 2 land was identified and where the fields were majority Grade 1 or 2, this was removed from the area of Solar PV development and retained for agricultural use in line with the project principles, as detailed below and within **Table 4.2 of Chapter 4: Approach to EIA**.
- 10.4.12. Embedded (primary) environmental mitigation measures that are considered to be an inherent part of the Proposed Development are detailed within **Table 4.4 of Chapter 4: Approach to EIA**. Those embedded mitigation measures relevant to this preliminary land, soil and groundwater assessment comprise the following:
- All fields comprising solely of Grade 1 or 2 land within the Site will remain in arable production.
 - Prioritise the use of BMV land for arable production where practicable.
 - Where not used for Solar PV development, BESS, or Springwell Substation, prioritise the use of non-BMV land for the creation of legacy/permanent habitats where practicable.
 - All internal access tracks and cable routes will use existing tracks, crossings and/or gaps in the hedgerows wherever practicable.
 - Grid Connection Corridor and cabling to connect the Solar PV development to the ITS, Collector Compound, BESS, and Springwell Substation will comprise below ground cables.
 - Cabling routes will run alongside access tracks as much as possible to avoid wider excavations.

Assessment methodology

- 10.4.13. For this preliminary assessment, the likely significant effects on identified receptors are reported based on the information available at the time of writing. The final assessment of likely significant effects will be reported in the ES.
- 10.4.14. A Minerals assessment, to demonstrate how impacts to Mineral Safeguarding Areas have been addressed, does not form part of this preliminary assessment, but will be reported within the ES once further baseline information has been obtained and further

consultation with Lincolnshire County Council has been undertaken.

Preliminary Risk Assessment

10.4.15. For the Preliminary Risk Assessment report, a desk-based assessment was completed in accordance with relevant British Standards and authoritative technical guidance. The assessment of the contamination status of the site is in line with the technical approach presented in Land Contamination Risk Management (LCRM) (Environment Agency, 2021) – which supersedes CLR11 Model Procedures for Land Contamination – and in general accordance with BS 10175: 2011 + A2 2017 (BSI, 2017). The scope of works included:

- review of the history of development on the Site and surroundings;
- assessment of local geology, hydrogeology and hydrology;
- review of relevant information held by appropriate statutory authorities;
- review of any previous site investigation reports made available;
- completion of a site reconnaissance survey (20th and 21st October 2022) to assess the visual condition of the Site;
- development of an initial Conceptual Site Model (CSM);
- preliminary consideration of geotechnical constraints and hazards; and,
- identification of the need for further action, e.g. intrusive investigations, if any.

10.4.16. The assessment of contaminated land is based on the development of a CSM. This approach identifies source, pathways and receptors at a site and assesses the potential for a link to exist between a source of contamination and a receptor which may then constitute a risk:

- Source: this is the identification of a specific source of contamination that is located on- or off-site.
- Pathway: this is the means by which the contaminant could migrate through the environment to reach a receptor.
- Receptor: can be property, humans, and the environment (e.g., controlled waters/ecology) which could be affected by contamination.

10.4.17. A pollutant linkage is considered to exist when all three components of the CSM are identified. The significance of each pollutant linkage is then assessed to identify potential risks.

Receptor sensitivity for land and soils

10.4.18. Sensitivity criteria for land and soils, derived from the IEMA Guide A New Perspective on Land and Soil in Environmental Impact Assessment¹⁸ are defined in **Table 10.4**.

Table 10.4 Land and Soils Receptor sensitivity

Sensitivity (in-situ soils)	Soil resource
Very High	<p>Biomass production: ALC Grades 1 & 2 or Land Capability for Agriculture (LCA) Classes 1 & 2</p> <p>Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected features within a European site (e.g., Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar); Peat soils; Soils supporting a National Park, or Ancient Woodland</p> <p>Soil carbon: Peat soils Soils with potential for ecological/landscape restoration</p> <p>Soil hydrology: Very important catchment pathway for water flows and flood risk management</p> <p>Archaeology, Cultural heritage, Community benefits and Geodiversity: Scheduled Ancient Monuments (SAMs) and adjacent areas; World Heritage and European designated sites; Soils with known archaeological interest; Soils supporting community/recreational/educational access to land covered by National Park designation</p> <p>Source of materials: Important surface mineral reserves that would be sterilised (i.e., without future access)</p>
High	<p>Biomass production: ALC Grade 3a, or LCA Grade 3.1.</p> <p>Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected features within a UK designated site (e.g., UNESCO Geoparks, Sites of Special Scientific Interest (SSSI) or Areas of Outstanding Natural Beauty (AONB), Special Landscape Area, and Geological Conservation Review sites); Native Forest and woodland soils; Unaltered soils supporting semi-natural vegetation (including UKBAP Priority habitats)</p> <p>Soil carbon: Organo-mineral soils (e.g., peaty soils)</p> <p>Soil hydrology: Important catchment pathway for water flows and flood risk management</p> <p>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 and</p>

¹⁸ Institute of Environmental Management & Assessment (IEMA) Guide: A New Perspective on Land and Soil in Environmental Impact Assessment (2022). Available online: [IEMA publishes new land and soils guidance - IEMA](#)

Sensitivity (in-situ soils)	Soil resource
	<p>Geomorphological Sites (RIGS); Soils supporting community /recreational/educational access to RIGS and AONBs Source of materials: Surface mineral reserves that would be sterilised (i.e. without future access)</p>
Medium	<p>Biomass production: ALC Grade 3b or LCA Grade 3.2 Ecological habitat, soil biodiversity and platform for landscape: Soils supporting protected or valued features within non-statutory designated sites (e.g., Local Nature Reserves (LNR), Local Geological Sites (LGSs), Sites of Nature Conservation Importance (SNCIs), Special Landscape Areas; 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 Source of materials: surface mineral reserves that would remain accessible for extraction</p>
Low	<p>Biomass production: ALC Grades 4 & 5 or LCA Grades 4.1 to 7 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 Source of materials: Surface mineral reserves that would remain accessible for extraction</p>
Negligible	<p>As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions</p>

Receptor sensitivity for groundwater

10.4.19. Sensitivity criteria for groundwater, derived from professional judgement, are defined in **Table 10.5**.

Table 10.5 Groundwater receptor sensitivity

Sensitivity	Criteria guide
High	<p>The receptor has low ability to absorb change without fundamentally altering its present character and is of high environmental value or of national importance. In terms of hydrological receptors, this relates to;</p> <ul style="list-style-type: none"> Principal aquifers (within Groundwater Source Protection Zone).
Medium	<p>The receptor has moderate capacity to absorb change without significantly altering its present character and has some environmental value or is of regional importance. In terms of hydrological receptors this relates to;</p> <ul style="list-style-type: none"> Principal aquifers (outside of Groundwater Source Protection Zone), Secondary (A, B or undifferentiated) aquifers (within Groundwater Source Protection Zone).
Low	<p>The receptor is tolerant of change without detriment to its character and is of low environmental value or local importance. In terms of hydrological receptors this relates to;</p> <ul style="list-style-type: none"> Secondary (A, B or undifferentiated) aquifers (outside of Groundwater Source Protection Zone) and Non-designated aquifers.

Magnitude of Impact for land and soils

10.4.20. Where an impact is considered to be present, the magnitude of the impact is classified using the criteria presented in **Table 10.6** below, which is derived from the IEMA Guide A New Perspective on Land and Soil in Environmental Impact Assessment¹⁹.

Table 10.6 Land and Soils Magnitude of Impact

Magnitude of impact (change)	Description of impacts restricting proposed land use
Major	<p>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 20ha or loss of soil-related features, as advised by other topic specialists in EIA team (including effects from ‘temporary developments’*)</p> <p>or</p> <p>Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of</p>

¹⁹ Institute of Environmental Management & Assessment (IEMA) Guide: A New Perspective on Land and Soil in Environmental Impact Assessment (2022). Available online: [IEMA publishes new land and soils guidance - IEMA](#)

Magnitude of impact (change)	Description of impacts restricting proposed land use
	more than 20ha, or gain in soil-related features, as advised by other topic specialists in EIA team (including effects from 'temporary developments'*)
Moderate	<p>Permanent, irreversible loss of one or more soil functions or soil volumes, over an area of between 5 and 20ha or loss of soil-related features, as advised by other topic specialists in EIA team (including effects from 'Temporary Developments'*)</p> <p>or</p> <p>Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20ha, or gain in soil-related features, as advised by other topic specialists in EIA team</p>
Minor	<p>Permanent, irreversible loss over less than 5ha or a temporary, reversible loss of one or more soil functions or soil volumes, or temporary, reversible loss of soil-related features, as advised by other topic specialists in EIA team.</p> <p>or</p> <p>Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 5ha 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, as advised by other topic specialists in EIA team</p>
Negligible	No discernible loss or reduction or improvement of soil functions or soil volumes that restrict current or proposed land use

* Temporary developments can result in a permanent impact if resulting disturbance or land use change causes permanent damage to soils.

Magnitude of Impact for groundwater

10.4.21. Where an impact is considered to be present, the magnitude of the impact is classified using the criteria presented in **Table 10.7** below, which are derived from professional judgement. Impacts can be beneficial or adverse.

Table 10.7 Groundwater magnitude of impact

Magnitude of impact	Criteria guide
High	Total loss or major alteration to key elements or features of the baseline conditions to the extent that post-development character or composition of baseline conditions will be fundamentally changed.

Magnitude of impact	Criteria guide
Medium	Loss or alteration to one or more key elements or features of the baseline conditions to the extent that post-development character or composition of the baseline conditions will be materially changed.
Low	Minor shift away from baseline conditions. Changes arising will be detectable but not material; the underlying character or composition of the baseline conditions will be similar to the pre-development situation.
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a 'no change' situation.

Significance of effect for land and soils

- 10.4.22. The significance of effect is based on the sensitivity of the receptor and the magnitude of impact, as outlined in **Table 10.8** below. The significance of effect can be adverse or beneficial.
- 10.4.23. The significance of an effect is reported as either 'significant' or 'not significant'. Any effects that have been determined as 'Moderate' or above are considered to be significant. Any effects that have been determined as 'Slight' or below are considered not significant.

Table 10.8 Land and Soils significance of effect criteria

		Magnitude of Impact				
		No Change	Negligible	Minor	Moderate	Major
Sensitivity	Very High	Neutral	Slight	Moderate or Large	Large or very large	Very Large
	High	Neutral	Slight	Slight or Moderate	Moderate or Large	Large or Very Large
	Medium	Neutral	Neutral or Slight	Slight	Moderate	Moderate or Large
	Low	Neutral	Neutral or Slight	Neutral or Slight	Slight	Slight or Moderate
	Negligible	Neutral	Slight	Slight	Neutral or Slight	Slight

Significance of effect for groundwater

- 10.4.24. The significance of effect is based on the sensitivity of the receptor and the magnitude of impact, as outlined in **Table 10.9** below.
- 10.4.25. The significance of an effect is reported as either ‘significant’ or ‘not significant’. Any effects that have been determined as ‘Moderate’ or above are considered to be significant. Any effects that have been determined as ‘Minor’ or below are considered not significant.

Table 10.9 Groundwater significance of effect criteria

Magnitude of impact	Sensitivity		
	High	Medium	Low
High	Major effect	Major or Moderate effect	Moderate or Minor effect
Medium	Major or Moderate effect	Moderate effect	Minor effect
Low	Moderate or Minor effect	Minor effect	Minor effect or negligible effect
Negligible	Negligible effect	Negligible effect	Negligible effect

10.5. Summary of baseline conditions

Land and groundwater

- 10.5.1. This section summarises the findings of the Preliminary Risk Assessment (see **Appendix 10.1**) undertaken on behalf of the Applicant in 2022.
- 10.5.2. A separate dataset has been reviewed for the siting zone for the Grid Connection Corridor, due to this land being incorporated into the Site boundary at a later date, following the completion of the Preliminary Risk Assessment.
- 10.5.3. The Site has largely remained undeveloped throughout its entire history, except for localised construction of minor structures, tracks, paths and access roads. Numerous stone pits, gravel pits and small quarries are shown to be distributed across the Site area.
- 10.5.4. The Site is primarily covered by a nominal to limited thickness of topsoil, with any made ground anticipated to be localised to distinct previously developed areas, such as former small structures, roads and paths. There may also be made ground ‘overspill’ from directly adjacent features such as the RAF airfield and sewage works.

- 10.5.5. As the Site covers a large area, the geological sequence is highly varied. Superficial deposits comprising Tidal Flat Deposits are localised in the north of the Site. In the central and southwestern parts of the Site, thin bands of Head Deposits and Sleaford Sand and Gravel are present directly over the bedrock as detailed in **Section 21.2 of Appendix 10.1**. There are large areas of the Site where superficial deposits are absent, according to the mapping presented in **Appendix 10.1**.
- 10.5.6. The bedrock outcrops in a sequence presenting itself from east (youngest) to west (oldest) and comprises Oxford Clay, Kellaways Formation (clays and mudstones), Cornbrash Formation (limestone), Blisworth Clay (clays and mudstones), Blisworth Limestone, Rutland Formation (mudstone with limestone beds) and the Lincolnshire Limestone Formation.
- 10.5.7. Through reference to historical British Geological Survey (BGS) borehole records, depths to groundwater appear to vary across the site dependent upon the strata. Groundwater in some cases was recorded at shallow depths (2-3m below ground level) within weathered limestones and locally within superficial deposits. Groundwater was generally recorded within limestone units at depths between 12m and 30m below ground level.
- 10.5.8. The Lincolnshire Limestone and Blisworth Limestone are classed as a Principal aquifer, with other limestone units (Kellaways Formation, Cornbrash Formation, Rutland Formation) classed as Secondary aquifers. The Oxford Clay and Blisworth Clay are classed as an Unproductive stratus; further detail is provided in **Section 13.3** and **Section 21.4 of Appendix 10.1**. A localised Source Protection Zone (SPZ) SPZ 1 (inner zone) is located within the Site boundary, centred to the west of Scopwick, protective of a groundwater abstraction located outside of the Site boundary.
- 10.5.9. SPZ 1 which is classed as the Inner Protection Zone is defined by a 50-day travel time from any point below the water table to the source or a minimum 50-metre radius from the source, whichever is larger. It is usually located immediately adjacent to the well, although in karst terrain can be remote. The Environment Agency's Approach to Groundwater Protection (2018)²⁰ sets the tightest controls on human activity in this zone. The zone is used to control a wide range of activities that could pose a significant risk to groundwater. The main purpose of this zone is to reduce the risk of pollution from rapidly degrading chemicals and some pathogens²¹.
- 10.5.10. Groundwater SPZ 3 is located within the Site boundary, within Springwell West, broadly at the south-westernmost boundary, to the south of Bloxham and to the north west of Blankney. The siting zone

²⁰ The Environment Agency's approach to groundwater protection. (2018). Available online: [The Environment Agency's approach to groundwater protection](#)

²¹ Environment Agency. Manual for the production of Groundwater Source Protection Zones (2019). Available online: [Groundwater source protection zones \(SPZ\): production manual - GOV.UK \(www.gov.uk\)](#)

for the Grid Connection Corridor is located approximately 500m south of an SPZ 3.

- 10.5.11. SPZ 3 which is classified as a Source Catchment Protection Zone, also referred to as the total catchment, Total Capture Zone or Catchment Protection Zone, is defined as the area needed to support the protected yield from long-term groundwater recharge. In areas where the aquifer is confined beneath low permeability strata, this source catchment may be located some distance from the actual abstraction. For heavily exploited aquifers (i.e. where groundwater abstraction represents a significant percentage of aquifer recharge), much of the recharge area will be covered by SPZs. Due to the interference between abstraction boreholes and seasonal variations in groundwater flow, it is difficult to define individual Catchment Protection Zones with certainty²².
- 10.5.12. The Site is low lying and crossed by a number of drainage ditches and smaller un-named streams, which generally flow towards the east. Some discharge into lesser watercourses such as Springwell Brook and Scopwick Beck, ultimately discharging into the River Witham several kilometres to the east of the Site.
- 10.5.13. The Preliminary Risk Assessment has only identified the use of pesticides and herbicides through the Site's agricultural history as a potential source of on-site contamination; however, it is not considered that there are significant levels of pesticides and herbicides and therefore these do not form part of the baseline.
- 10.5.14. The presence of made ground in some areas of the Site is likely, although this is considered to be limited to minor previously developed areas such as small structures (i.e. wind pumps) and tracks, paths and access roads. There are a number of former stone/gravel pits, as well as ponds that have the potential to be infilled with unknown material, although it is likely that any infill comprised natural and/or inert soils.
- 10.5.15. Two landfills at Brauncewell and Longwood Quarry have been identified as potential significant off-site point sources of contamination as part of the baseline assessment. These landfills were licensed to accept inert and non-biodegradable waste. The permit for the landfill site at Longwood Quarry has recently been surrendered (effective from 13 April 2023), with documentation provided by the Environment Agency to confirm that:
 - actions had been completed to avoid a pollution risk; and
 - the site had been returned to a satisfactory state, having regard to the state of the site before the facility was put into operation.

²² Environment Agency. Manual for the production of Groundwater Source Protection Zones (2019). Available online: [Groundwater source protection zones \(SPZ\): production manual - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/784222/groundwater-source-protection-zones-spz-production-manual-2019.pdf)

- 10.5.16. Longwood Quarry landfill has therefore been demonstrated to not present a potential significant off-site source of contamination.
- 10.5.17. The landfill site at Brauncewell may form an off-site point source of contamination, with its proximity and currently active status meaning that risks may exist for affected zones, but only if the Proposed Development in these areas comprises manned structures or un-manned enclosed structures where gases could accumulate, which is unlikely.
- 10.5.18. Two potential complete pollutant linkages have been identified, associated with:
- Potential impaction of shallow groundwater within SPZ1 via leaching of contaminated soils through the infiltration of rainwater; and
 - Migration of ground gases from an adjacent landfill site and accumulation in structures.

Soils and agricultural land

- 10.5.19. The results of the ALC survey completed for the Site (excluding cable routes) are presented in **Table 10.10** and displayed in **Figure 10.1**. As noted above, ALC surveys will be undertaken of cable routes that connect the Solar PV development to the Springwell Substation and of the Grid Connection Corridor once the route has been refined. Information provided in this section has been based on the existing ALC survey data.
- 10.5.20. The results are detailed by Grade in hectares and outlined as percentage of the Site. The figures have been rounded to the nearest hectare and one decimal place for the percentage. It is worth noting that the ALC survey results include all land, apart from the cable routes, which are to be surveyed prior to the ES to help inform the requirements of the Outline Soil Management Plan. Therefore, the survey covers land that now does not form part of the current area of development, and which has since been discounted from the area of proposed Solar PV development.

Table 10.10 ALC survey results of the Site

Grade/subgrade category	Springwell West		Springwell Central		Springwell East		Whole Site	
	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
Grade 1			-	-	23.8	5.5	23.8	1.6
Grade 2	45.4	5.7	44.2	19	75.3	17.5	164.9	11.3
Subgrade 3a	296.2	37.3	128.4	55	168.6	39.1	593.2	40.7

Grade/subgrade category	Springwell West		Springwell Central		Springwell East		Whole Site	
	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)	Area (ha)	Area (%)
Subgrade 3b	453.0	57.0	56.5	24	163.3	37.9	672.8	46.1
Grade 4	-	-	4.2	2	-	-	4.2	0.3
Grade 5	-	-	-	-	-	-	-	-
Non-agricultural	-	-	-	-	-	-	-	-
Urban	-	-	-	-	-	-	-	-
Total	794.6	100	233.3	100	431	100	1,458.9	100

- 10.5.21. Grade 1, Grade 2 and Grade 3a soils which are considered to be BMV land account for 53.6% of the total Site. In England, agricultural land across England represents between 69-70% of the total land within the country. Natural England estimates that around 42% of agricultural land within England is of ‘Best and Most Versatile’ (BMV) quality (with a roughly even split of 21% as Grades 1 and 2 and 21% Grade 3a) with the proportion of BMV in Lincolnshire rising to 71.2%, which is significantly above the national average. Therefore, in the context of the county, BMV land is abundant.
- 10.5.22. Agricultural land quality is referred to in the Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) and it notes that lower quality agricultural land, should be preferred, avoiding BMV land “where possible”. However, given the high presence of BMV land in the region and the urgent need for new energy generation infrastructure, particularly from renewable sources such as solar, as detailed in **Chapter 3: Reasonable Alternatives Considered, the Proposed Development** would not be deliverable without the temporary use of some BMV land.
- 10.5.23. However, as indicated in the zonal masterplan **Figure 2.3**, not all of the Site will be used for Solar PV development. The potential use of BMV land has been a key consideration in the development of the design, as discussed in **Chapter 3: Reasonable Alternatives Considered** and several fields have been removed due to them being classified as high grade BMV agricultural land.
- 10.5.24. The design development has been guided by the project principles as discussed in **Chapter 4: Approach to EIA** and as outlined in **paragraph 10.11.4** below. The principles seek to prioritise the use of BMV land for arable production where practicable and keep fields comprising solely of Grade 1 and 2 within arable production. The

areas of the Site that will be retained for arable production will be defined within the ES.

- 10.5.25. A summary of the ALC results for the current proposed area of Solar PV development are presented in **Table 10.11**. In comparison to the area of BMV land within the Site which equates to 53.6%, the area of Solar PV development comprises approximately 43.5% and comprises no Grade 1 land.

Table 10.11 ALC survey results of the area of Solar PV development

ALC grade	Area (ha)	Percentage (%)
Grade 1	0	0
Grade 2	38.6	4.74
Grade 3a	316.3	38.77
Grade 3b	456.6	55.97
Grade 4	4.2	0.52
Total	815.7	100.00

- 10.5.26. Soils have a number of functions beyond biomass production, for which the ALC process is relevant. Other functions can include ecological habitat, soil carbon reserves, soil hydrology as a pathway for water flow, archaeological and cultural interest and as a source of materials²³.

Future baseline

- 10.5.27. Within the Site boundary, the land would be expected to continue in arable agricultural use in the future. The types of crops grown may change over time depending on the landowner/tenant farmers' preference and market trends. Changing climatic conditions resulting from climate change may influence the choice of crops. For the purpose of this preliminary assessment, it is considered that there is unlikely to be any change to the baseline position with respect to the land, groundwater or agricultural land classification.

²³ Institute of Environmental Management & Assessment (IEMA) Guide: A New Perspective on Land and Soil in Environmental Impact Assessment (2022). Available online: J35787_IEMA_Land_and_Soils_Guidance.pdf

10.6. Likely effects, additional mitigation and residual effects

Construction phase

Table 10.12 Assessment of likely effects, additional mitigation and residual effects during construction

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Land contamination	Likely effects	<p>Construction activities could lead to localised contamination of soils related to potential spills from construction plant through operation or refuelling activities. If contaminated soils associated with past developments are identified, these could be a minor localised source of contamination if they are not managed correctly.</p>
	Additional (secondary and tertiary) mitigation	<p>An Outline Construction Environmental Management Plan will be submitted in support of and secured by the DCO. The Construction Environmental Management Plan will be implemented and managed by the contractor undertaking the construction works. The Construction Environmental Management Plan will set out measures to avoid, minimise or mitigate effects on the environment during construction. This would include procedures to mitigate against erosion and contaminated land and include emergency procedures to manage accidental spillages and leaks.</p> <p>The construction phase of works would be audited and monitored against the requirements of the Construction Environmental Management Plan by the contractor to ensure adherence.</p>
	Likely residual effects	<p>There are not shown to be any significant sensitive receptors based on the findings of the Preliminary Risk Assessment, and therefore they are considered to have low sensitivity. The magnitude of impact is considered to be negligible and the significance of the effect is therefore neutral or slight adverse and not significant.</p>

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Groundwater	Likely effects	<p>Construction including piling activities, earthworks, access tracks and excavation could lead to minor damage to field drains which may affect the localised drainage of the agricultural land and the groundwater quality of the underlying aquifer and source protection zone.</p> <p>As a result of the construction works, spillages and leaks of fuels, oils and chemicals may lead to effects on groundwater which could result in potential pollution to any underlying aquifers. This may arise from runoff associated with construction activities (e.g., silt run-off during earthworks and accidental spills and leaks from construction plant).</p>
	Additional (secondary and tertiary) mitigation	<p>An Outline Construction Environmental Management Plan will be submitted in support of and secured by the DCO. The Construction Environmental Management Plan will be implemented and managed by the contractor undertaking the construction works. The Construction Environmental Management Plan will set out measures to avoid, minimise or mitigate effects on the environment during construction. This would include best practice procedures, including requirements for pollution prevention and emergency procedures to manage minor accidental spillages and leaks.</p>
	Likely residual effects	<p>The aquifers, particularly in the areas of the Source Protection Zone, are deemed to have a high sensitivity. The magnitude of impact of construction activity on groundwater quality would be negligible and therefore the significance of effect is considered to be negligible and not significant.</p>
Soils and agricultural land	Likely effects	<p>Construction activities, including trafficking of agricultural land by construction vehicles, construction compounds, installation of the cable route and earthworks may lead to compaction</p>

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
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and deterioration of soils and agricultural land during the construction phase.

Access tracks and steep slopes within the Site are likely to be most susceptible to deterioration through erosion.

Some soils are more susceptible to damage when handled during construction. There will be limited handling and moving of soils during the construction of the Proposed Development and this will be avoided, where practicable. Some soils are, however, more susceptible to structural damage from the use of machinery and vehicular activity, depending upon soil type, climate and wetness class.

The development of the design has sought to minimise the use of BMV land. The design has been guided by the project principles as outlined above in **paragraph 10.4.11**, which have sought to prioritise the use of BMV land for arable production where practicable, including retaining all fields comprising solely of Grade 1 and 2 land and prioritising the use of non-BMV land for the creation of permanent habitats to avoid any permanent loss of high quality agricultural land.

It is worth noting that consultation has also been undertaken with the landowners to understand the productivity of the soils across the Site, taking into account the use of irrigation and access and to discuss suitable areas for the creation of permanent habitats.

The design of the Proposed Development is still being progressed to consider the impacts on BMV land and will continue to be refined following consultation feedback.

Additional (secondary and tertiary) mitigation	An Outline Soil Management Plan will be submitted in support of and secured by the DCO to manage any potential impacts to the soil (and agricultural land) during and on completion of the construction phase. The Outline Soil Management Plan will identify those areas within the Site which
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Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
	<p>may be more susceptible to damage, for example, the temporary access tracks, construction compounds and steep slopes and qualities of the soil, for example when it is wet or after periods of heavy rainfall or high winds and it will advise on when soils are suitable for being handled or trafficked. The Plan will also detail measures for soil management and follow the principles of best practice to maintain the physical properties of the soil, with the aim of restoring the land to its pre-construction condition following the temporary construction use and at the end of the lifetime of the Proposed Development.</p> <p>The construction phase of works would be audited against the requirements of the SMP by the contractor to ensure adherence.</p>
Likely residual effects	<p>Soils and agricultural land on the Site are classified as high sensitivity. Overall, the magnitude of impact to soils and agricultural land during the construction is likely to be negligible as there will be no discernible loss or reduction or improvement of soil functions or soil volumes. Therefore, it is considered that the significance of effect would be slight adverse and not significant.</p>

Operational phase

Table 10.13 Assessment of likely effects, additional mitigation and residual effects during operation

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
Land contamination	<p>Likely effects Large numbers of vehicle movements within the Site during operation are not anticipated and therefore the potential for vehicle movements to cause compaction or vehicles to cause contamination through losses/leaks is considered negligible.</p> <p>Additional (secondary) There are not shown to be any significant sensitive receptors based on the findings of the Preliminary Risk Assessment, and any</p>

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
	<p>and tertiary) mitigation potential impacts to land contamination and groundwater will be managed and secured by the implementation of an Outline Operational Environmental Management Plan which will outline measures to prevent damage to the land during the operation of the Proposed Development.</p> <p>Likely residual effects There are not shown to be any significant sensitive receptors based on the findings of the Preliminary Risk Assessment, and therefore they are considered to have low sensitivity. The magnitude of impact is considered to be negligible, and the significance of the effect is therefore neutral or slight adverse and not significant.</p>
Groundwater	<p>Likely effects As a result of the maintenance works, including cleaning of the Solar PV Panels and vehicle tracking, spillages and leaks of fuels, oils and chemicals may lead to effects on groundwater which could result in potential pollution to any underlying aquifers.</p> <p>The presence of piled foundations and increase in impermeable areas such as concrete hardstanding for the collector compounds, BESS and Springwell Substation may locally affect the groundwater infiltration rates across the Site.</p> <p>It is anticipated that the BESS compound will incorporate a bund feature which will prevent firewater from leaving the Site, should this be required. However, in the instance of a failure, there is a potential for chemicals to infiltrate which could result in potential pollution to the groundwater and any underlying aquifers.</p> <p>Additional (secondary and tertiary) mitigation Pile depths would be minimised, where practicable, and areas of impermeable surfaces will be assessed in the Flood Risk Assessment (refer to Chapter 13: Water) and designed to ensure groundwater infiltration and any risk of groundwater flooding is mitigated.</p>

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
	<p>Measures to avoid, minimise or mitigate effects on the environment will be documented within and secured by the Outline Operational Environmental Management Plan. This would include best practice procedures, including measures for pollution prevention and emergency procedures to manage accidental spillages and leaks.</p> <p>To manage the potential impact of firewater, which may contain chemicals infiltrating the ground, a tanker would be required to remove firewater and so preventing the release of firewater to the surrounding environment. The procedures for managing the firewater and mitigating any impact to the environment will be documented within and secured by the Outline Operational Environmental Management Plan and requirements for the control and safety of the BESS will be documented within and secured by the Battery Safety Commitments document.</p> <p>Likely residual effects</p> <p>The aquifers, particularly in the areas of the Source Protection Zone, are deemed to have a high sensitivity. The magnitude of impact on groundwater quality during the operational phase would be negligible and therefore the significance of effect is considered to be negligible and not significant.</p>
Soils and agricultural land	<p>Likely effects</p> <p>There is anticipated to be limited ground disturbance or trafficking over the soils during decommissioning in comparison to the construction phase, due to the use of operational access tracks which would be implemented during the construction phase. There would be limited trafficking over the operational access tracks and across the land, apart from periodic maintenance requirements, including replacement of damaged parts or cleaning and maintenance of the Solar PV panels.</p> <p>The Proposed Development will lead to temporary impacts to soil and agricultural land for the duration of the operational</p>

Receptor/matter

Likely effects/additional (secondary and tertiary) mitigation/residual effects

phase, assumed to be 40 years, in particular, the areas in which the BESS, Collector Compounds, Springwell Substation, ITS and operational access tracks will be located. The area of land underneath the Solar PV panels and within the field margins will be used for ecological mitigation and enhancements, which will include planting, including establishment of grassland and wildflowers which would help to reduce soil degradation and erosion during the operational phase which could lead to potential benefits.

It is anticipated that the operational phase of the Proposed Development would lead to a temporary change of land use of approximately 1,458 hectares of agricultural land, of which, approximately 782 hectares is classified as BMV land. The area of BMV agricultural land within Lincolnshire is estimated to be approximately 380,000 hectares. The area of BMV land within the Proposed Development is a small percentage of the wider BMV land area available in Lincolnshire. Set in this context, the predicted temporary land use change of 782 hectares of BMV land is considered negligible.

It is recognised that this does not account for other projects within Lincolnshire that may lead to a reduction in available BMV land. For the purposes of this PEIR, a cumulative assessment which considers other projects that may impact BMV land is detailed in **Chapter 15**. Consultation will be undertaken with North Kesteven District Council and Lincolnshire County Council to agree the list of projects that need to be considered in the cumulative assessment. The detailed cumulative assessment will be presented within the ES.

Additional (secondary and tertiary) mitigation

Embedded mitigation to minimise the use of BMV land is detailed in **Section 10.4** above.

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
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Measures to ensure the quality of the land is maintained throughout the operational phase of the Proposed Development will be documented within and secured by the Outline Soil Management Plan and the Outline Operational Environmental Management Plan. The Outline Soil Management Plan will identify those areas within the Site which may be more susceptible to damage, for example, steep slopes and qualities of the soil, for example when it is wet or after periods of heavy rainfall or high winds and will advise on when soils are suitable for being handled or trafficked. The Outline Soil Management Plan will also detail measures for soil management and follow the principles of best practice to maintain the physical properties of the soil, with the aim of maintaining the condition of the land until the end of the lifetime of the Proposed Development.

Whilst the potential impact on soils during the operational phase are expected to be minimal, good practice will be employed to ensure that any works (such as the maintenance and the management of the land underneath the Solar PV Modules) will be undertaken in a manner that prevents damage to the soil resource, so far as possible.

The land within the Site, including the land underneath the panels and within the fields margins, will be managed through the implementation of an Outline Landscape and Ecological Management Plan, which will be submitted in support of and secured by the DCO. This Plan will set out requirements for the management and remediation of vegetation during the operational phase to ensure the planting is sustained for the life of the Proposed Development.

Likely residual effects

The land upon which the Proposed Development is to be located is considered to have a **high** sensitivity due to areas of

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
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Grade 3a land located across the current area of Solar PV development. Due to the temporary nature of the development and additional mitigation that will prevent damage to the soil resource, the magnitude of impact is considered to be **minor**. Therefore, the significance of effect is considered to be **slight or moderate adverse** and **potentially significant**.

Decommissioning phase

Table 10.14 Assessment of likely effects, additional mitigation and residual effects during decommissioning

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
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Land contamination	<p>Likely effects</p> <p>Decommissioning activities could lead to minor localised contamination of soils related to potential spills from plant.</p> <p>There is potential for erosion of soils associated with works conducted on steep slopes within the Site boundary.</p> <p>Any effects on soils during decommissioning would not be expected to be significant as the number of vehicle movements is anticipated to be less than during the construction phase, limiting the potential for compaction of soils to occur. Decommissioning works are also less likely than construction works to adversely impact on agricultural field drains as there would be no requirement for piling., so are less likely to result in deterioration of soil quality.</p>
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Additional (secondary and tertiary) mitigation	<p>The Outline Decommissioning Environmental Management Plan will be implemented by the contractor for the duration of the decommissioning works. The purpose of the Plan is to set out requirements to avoid, minimise or mitigate effects on the environment. This would include best practice procedures to mitigate against erosion and contaminated land and include emergency procedures to manage accidental spillages and leaks.</p>
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Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		<p>The decommissioning phase of works would be audited against the requirements of the Outline Decommissioning Environmental Management Plan by the contractor to ensure adherence.</p>
	Likely residual effects	<p>There are not shown to be any significant sensitive receptors based on the findings of the Preliminary Risk Assessment, and therefore they are considered to have low sensitivity. The magnitude of impact is considered to be negligible, and the significance of the effect is therefore neutral or slight adverse and not significant.</p>
Groundwater	Likely effects	<p>Decommissioning activities, including earthworks and excavation, could lead to minor damage to field drains which may affect the localised drainage of the agricultural land and the groundwater quality of the underlying aquifer and source protection zone.</p> <p>As a result of the decommissioning works, spillages and leaks of fuels, oils and chemicals may lead to effects on groundwater which could result in potential pollution to any underlying aquifers. This may arise from runoff associated with activities (e.g., silt run-off during earthworks and accidental spills and leaks from machinery).</p>
	Additional (secondary and tertiary) mitigation	<p>The Outline Decommissioning Environmental Management Plan would be implemented by the contractor for the duration of the decommissioning works. The purpose of the Plan is to set out requirements to avoid, minimise or mitigate effects on the environment. This would include best practice procedures to mitigate against erosion and contaminated land and include emergency procedures to manage accidental spillages and leaks. The decommissioning phase of works would be audited against the requirements of the Outline Decommissioning</p>

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
	<p>Environmental Management Plan by the contractor to ensure adherence.</p> <p>Likely residual effects The aquifers, particularly in the areas of the Source Protection Zone, are deemed to have a high sensitivity. The magnitude of impact on groundwater quality during the decommissioning phase would be negligible and therefore the significance of effect is considered to be negligible and not significant.</p>
Soils and agricultural land	<p>Likely effects The decommissioning phase would involve the dismantling and removal of the majority of the infrastructure, including the Solar PV development, Collector Compounds, BESS, and Springwell Substation. This land would be returned to agricultural use following the decommissioning phase.</p> <p>All concrete, hardstanding areas, foundations for the infrastructure and any internal tracks will be removed to a depth of up to 1m. It is assumed that all the below ground cables will be left in situ as these are likely to be located at a depth greater than 1m, therefore, limiting the disturbance and impact to the soil quality.</p> <p>The location of the BESS, Springwell Substation, ITS, and access tracks are anticipated to be restored using soil retained onsite, which could have been retained on site in managed bunds or with new topsoil that would be brought to the Site.</p> <p>The trafficking of soils when conditions are unsuitable (e.g., when soils are wet) could damage soil structure necessitating remedial activity to restore quality.</p>
	<p>Additional (secondary and tertiary) mitigation The Outline Decommissioning Environmental Management Plan would be implemented by the contractor to avoid, minimise, or mitigate effects on the environment during the decommissioning phase. The Plan will identify areas of the Site that may be more susceptible to damage, for example, steep slopes and will advise on when soils are suitable for being</p>

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
	<p>handled or trafficked. This will also include industry good practice requirements to ensure that all works during the decommissioning phase are undertaken in a manner that prevents damage to the soil resource, so far as possible.</p> <p>The decommissioning phase of works would be audited against the requirements of the Outline Decommissioning Environmental Management Plan by the contractor to ensure adherence.</p>
Likely residual effects	<p>Agricultural land on the Site is considered to be of high sensitivity. Overall, the magnitude of impact to agricultural land during the decommissioning phase of works is likely to be negligible as soils will be managed to prevent damage to the soil resource, so far as possible and will be returned to agricultural use. Therefore, it is considered that the significance of effect would be slight adverse and not significant.</p>

Assessment against future baseline

10.6.1. The future baseline for land, groundwater and agricultural land classification is anticipated to be similar to that found at present as it is anticipated that in the absence of the Proposed Development, existing agricultural practices on the land would continue.

10.7. Opportunities for environmental enhancement

10.7.1. There is potential that soil health could be enhanced over the assumed 40-year period of operation of the Proposed Development due to the implementation of a Soil Management Plan and due to the permanent cover of grassland and wildflowers which would reduce the impact of soil erosion. This will be examined further and detailed in the ES.

10.8. Intra-project combined effects

10.8.1. It is recognised that there is potential for the interaction and combination of different environmental residual effects from within the Proposed Development to affect certain receptors discussed in this preliminary land, soils, and groundwater assessment. For example, there is a synergy between this assessment and the biodiversity and water assessments (presented in **Chapter 6** and **Chapter 13** respectively).

- 10.8.2. The potential changes in land use will be managed and any impacts to the land, soil quality and groundwater will be mitigated by measures documented within and secured by the Outline Soil Management Plan and the Outline Landscape and Ecological Management Plan. Therefore, it is not considered that there will a potential for significant intra-project effects associated with this aspect of the Proposed Development.
- 10.8.3. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

10.9. Difficulties and uncertainties

- 10.9.1. The information provided in this PEIR is preliminary and is based on the information available at the time of writing. The final assessment of likely significant effects will be reported in the ES.

10.10. Further work to inform the ES

- 10.10.1. An ALC survey is planned to be undertaken on the cable routes that would connect the Solar PV development to the Springwell Substation and of the Grid Connection Corridor once the route has been refined. The survey will inform the assessment to be reported in the ES and the preparation of the Outline Soil Management Plan.
- 10.10.2. Further consultation with statutory consultees, including North Kesteven District Council and Lincolnshire County Council, will be undertaken in relation to the agricultural land classification results and the Outline Soil Management Plan as part of the ongoing assessment.
- 10.10.3. A review of the cumulative availability of BMV land in the region will be undertaken following consultation and agreement of the assessment approach with statutory consultees, including North Kesteven District Council and Lincolnshire County Council. A detailed cumulative assessment of BMV land in the region will be presented in the ES.
- 10.10.4. A Minerals Safeguarding assessment will be undertaken to inform the design of the Proposed Development and will form part of the Planning Statement submitted in support of the DCO application. Consultation will be undertaken with Lincolnshire County Council to discuss the Minerals Safeguarding Assessment and to understand any future ambitions for minerals extraction within the region.



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