Springwell Solar Farm

Consultation Report
Appendix L-1.1

APFP Regulation 5(2)(q)

Planning Act 2008

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009

EN010149/APP/5.2
November 2024
Springwell Energyfarm Ltd

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Appendix L-1.1 – Preliminary Environmental Information Report

Application Document Ref: EN010149/APP/5.2
Planning Inspectorate Scheme Ref: EN010149

Springwell Solar Farm

Preliminary Environmental Information Report

Volume 1

Phase 2 consultation
Springwell Energyfarm Ltd

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Non-Technical Summary of preliminary assessment of effects

The below table summarises the likely environmental effects that have been identified in the preliminary assessment, additional mitigation measures proposed and whether the effect is considered likely to be significant or not following the application of the proposed additional mitigation measures (residual effect).

The preliminary assessment has been undertaken based on the Proposed Development as detailed in **Chapter 2** of this **Preliminary Environmental Information Report** and does not represent the final design. The level of assessment and mitigation measures vary in detail, depending on the level of assessment that has been undertaken to date. The feedback received from this Statutory Consultation, alongside further survey and design work, will further inform the design of the Proposed Development. These, together with a final assessment of the effects, will be presented in the Environmental Statement and submitted in support of the Development Consent Order application.

This preliminary assessment has been based on the principle that measures have been 'embedded' into the design of the Proposed Development to avoid, prevent, reduce or offset potential significant environmental effects as far as practicable, for example by the considered placement and design of infrastructure. Further detail is provided in **Chapter 4, Table 4.4** of this **Preliminary Environmental Information Report**. This Preliminary Environmental Information Report also details further work to be undertaken to inform the Environmental Statement, which is presented within **Chapters 5-15** of this **Preliminary Environmental Information Report**.

Non-technical summary of preliminary assessment of effects

Air Quality	
Likely effects during construction	**Additional mitigation during construction**
• Impacts from dust and particulate matter. • Traffic exhaust emissions.	• Site-specific dust mitigation measures will be based on the results of pre-mitigation dust impacts assessment (to be presented in the Environmental Statement). • General dust and particulate matter control measures such as construction site management and site monitoring will be documented within the Construction Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. • Mitigation measures relating to traffic exhaust emissions will be documented within the Construction Environmental Management Plan and Construction Traffic Management Plan (which will include a Construction Logistics Plan), which will be secured via requirements in the Development Consent Order. • Outlines of the Construction Environmental Management Plan and Construction Traffic Management Plan will be submitted in support of the Development Consent Order application.
Likely effects during operation	**Additional mitigation during operation**
• No site activities resulting in significant emissions to air quality are anticipated during operation. • Limited movement of vehicles are expected just for maintenance purposes.	No additional mitigation measures are required.
Likely effects during decommissioning	**Additional mitigation during decommissioning**
• Impacts from dust and particulate matter. • Traffic exhaust emissions.	• Site-specific dust mitigation measures will be based on the results of pre-mitigation dust impacts assessment (to be presented in the Environmental Statement). • General dust and particulate matter control measures such as construction site management and site monitoring will be documented within the Construction Environmental Management Plan, which will be secured via a requirement in the Development Consent Order.

	• Mitigation measures relating to traffic exhaust emissions will be documented within the Construction Environmental Management Plan and Construction Traffic Management Plan (which will include a Construction Logistics Plan), which will be secured via requirements in the Development Consent Order. • Outlines of the Construction Environmental Management Plan and Construction Traffic Management Plan will be submitted in support of the Development Consent Order application.
Summary of likely residual effects	
Residual dust and particulate matter effects during construction, operation and decommissioning are likely to be **not significant**. Residual traffic effects during construction, operation and decommissioning are likely to be **not significant**.	
Biodiversity	
Likely effects during construction	**Additional mitigation during construction**
• Dust pollution and impacts to sensitive receptors, including Local Wildlife Sites. • Noise and visual disturbance. • Removal of vegetation to facilitate underground cable installation. • Habitat loss including impact to rare and notable arable (non-crop) plants. • Loss of breeding and foraging habitat for ground nesting birds and wintering birds. • Displacement of ground nesting birds and wintering birds. • Disruption of bat flight paths, loss of roosting habitats and disturbances. • Potential disturbance to water vole and otters.	• Signage and security fencing around works buffer zones. • Implementation of standard environmental protection measures such as dust suppression and pollution prevention, which will be documented within the Construction Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. • Habitat creation and enhancement measures to maintain habitat for ground nesting birds and to increase the foraging habitat available. This will be documented within the Landscape and Ecological Management Plan, which will be secured via a requirement in the Development Consent Order. • Measures to protect areas retained for farmland and wintering birds, including security fencing to maintain buffer zones to avoid noise and visual disturbance and signage. This will be documented within the Construction Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. • Any loss of bat roosts will be mitigated and compensated under European Protected Species licensed mitigation works. Once the amount of hedgerow which needs to be removed is quantified, then an appropriate strategy will be documented within the Construction Environmental Management Plan and the

	Landscape and Ecological Management Plan, which will be secured via requirements in the Development Consent Order. • Lighting mitigation measures such as construction lighting would be directed away from hedgerows and trees and will be documented within the Construction Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. • Pollution prevention mitigation measures will be documented within the Construction Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. • Signage and fencing will be used to maintain minimum 10 metres and 6 metres works buffer to protect main rivers and ditches respectively, where required. • A monitoring programme will ensure implementation of mitigation measures, as documented within the Construction Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. • Outlines of the Construction Environmental Management Plan and Landscape and Ecological Management Plan will be submitted in support of the Development Consent Order application.
Likely effects during operation	**Additional mitigation during operation**
Displacement of ground nesting birds.	• Habitat creation, enhancement and a management/monitoring programme will be documented within the Landscape and Ecological Management Plan, which will be secured via a requirement in the Development Consent Order. • An outline of the Landscape and Ecological Management Plan will be submitted in support of the Development Consent Order application.
Likely effects during decommissioning	**Additional mitigation during decommissioning**
• The effects of decommissioning are likely to be similar to those for construction outlined above. • Habitats and protected or notable species are likely to be subject to temporary loss of habitat or disturbance during decommissioning activities.	• Appropriate measures to minimise direct loss of habitat and disturbance will be documented within the Decommissioning Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. • An outline of the Decommissioning Environmental Management Plan will be submitted in support of the Development Consent Order.

Summary of likely residual effects
Dust generation, and noise and visual effects on Local Wildlife Sites during construction are likely to be **not significant**. Removal of hedgerows and trees and habitat loss, impacting rare or notable arable plants during construction are likely to be **not significant** as mitigation and compensation planting will likely offset any hedgerow loss after construction. Residual effects on nesting birds and wintering birds during construction are likely to be **not significant**. Residual effects on bats are likely to be **significant adverse up to District level** due to the possible removal of hedgerow for internal access tracks. However, the design of the Proposed Development is still evolving and this will be taken into consideration during the development of the design. A full assessment will be detailed within the Environmental Statement. Potential disturbance to water vole and otter during construction is likely to be **not significant**. Residual effects on ground nesting birds are likely to be **beneficial at the Local level**. The determination of whether this effect will be significant or not will be confirmed in the Environmental Statement, following further work that is required to be undertaken.

Climate	
Likely effects during construction	**Additional mitigation during construction**
Greenhouse gas emissions.	• Measures to decrease greenhouse gas emissions will be documented within the Construction Environmental Management Plan and the Construction Traffic Management Plan, which will be secured via requirements to the Development Consent Order. These are anticipated to include: - Measures to decrease fuel use by maximising energy efficiencies. - Promoting the use of sustainable fuels in construction vehicles, and where possible making use of electric vehicles. - Liaising with construction staff to minimise greenhouse gas emissions associated with commute to site (e.g. use of staff minibuses, car sharing options and use of public transport). - Using locally sourced and/or materials with lower embodied carbon. - Carrying out actions to meet the waste hierarchy according to the Government's Resources and Waste Strategy 2018 principles. - Promoting the recycling of materials by segregating construction waste to be re-used and recycled.

	• Outlines of the Construction Environmental Management Plan and the Construction Traffic Management Plan will be submitted in support of the Development Consent Order application.
Likely effects during operation	**Additional mitigation during operation**
Greenhouse gas emission savings.	No additional mitigation measures are required.
Likely effects during decommissioning	**Additional mitigation during decommissioning**
Greenhouse gas emissions.	Due to the potential advancements in technology and best practice between the present and the time in which decommissioning will take place, it is difficult to accurately propose mitigation at this time. However, mitigation as part of the decommissioning phase will be documented within the Decommissioning Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. An outline of the Decommissioning Environmental Management Plan will be submitted in support of the Development Consent Order application.
Summary of likely residual effects	
Greenhouse gas emissions during construction are likely to be **not significant**. Greenhouse gas emission savings during operation are likely to have a **significant beneficial** effect on climate. Greenhouse gas emissions during decommissioning are likely to be **not significant**.	
Cultural Heritage	
Likely effects during construction	**Additional mitigation during construction**
• Potential for damage to Milepost (Grade II Listed Building). • Potential for disturbance or damage to the Avro Lancaster crash site and Hawker Hurricane crash site. • Potential for disturbance or damage to currently unknown below ground archaeological remains.	• The milepost will be clearly demarcated in advance of construction. Toolbox talks will be given to contractors. • A programme to identify any remains of the crash will be documented within the Construction Environmental Management Plan, which will be secured via requirements to the Development Consent Order. An outline of the Construction Environmental Management Plan will be submitted in support of the Development Consent Order application.

	• A programme of archaeological investigation will be secured via a requirement in the Development Consent Order. Where the investigation finds that currently unknown archaeological remains are present and are of such importance as to merit preservation in situ, mitigation will take the form of limiting the ground disturbance in these areas through the use of concrete pad foundations, altering the route of cables or limiting the depth of excavation.
Likely effects during operation	**Additional mitigation during operation**
• Potential for changes to the setting of the Scheduled remains of former village of Brauncewell and former village of Dunsby. • Potential for changes to the setting of Scopwick Conservation Area and Blankney Conservation Area. • Potential for changes to the setting of currently unknown below ground archaeological remains.	• Hedgerow planting to screen the panels from the scheduled monument and conservation areas. • Potential impacts to currently unknown below ground archaeological remains could be mitigated (if required) through changes to the layout or other mitigation during construction (see above) or could be offset through additional research and interpretation.
Summary of likely residual effects	
Residual cultural heritage effects during construction and operation are likely to be **not significant**.	
Landscape and Visual	
Likely effects during construction and decommissioning	**Additional mitigation during construction and decommissioning**
• Change to landscape character. • Views of construction/decommissioning activities from RAF Digby and Ashby de la Launde. • Views of construction/decommissioning activities from individual and isolated residential properties. • Views of construction/decommissioning activities from public rights of way. Views of construction/decommissioning activities from Navenby Lane.	It is unlikely that any additional mitigation would be effective during the construction/decommissioning phases due to the short term and temporary nature of these works and therefore none have been identified in the **Preliminary Environmental Information Report** at this stage. However, once more detail is available about the likely construction/decommissioning activities, this will be reviewed to identify if any additional mitigation is appropriate.

• Views of construction/decommissioning activities from Bloxham Woods Local Nature Reserve Footpath. • Views of construction/decommissioning activities from Church Lane, Church and properties at Brauncewell. • Views of construction/decommissioning activities from minor roads to Temple Bruer and Thompson's Bottom Farm. • Views of construction/commissioning activities from the A15, B1191, B1188 and B1189.	
Likely effects during operation	**Additional mitigation during operation**
• Change to landscape character. • Effects during operation on visual receptors including RAF Digby, Ashby de la Launde and individual/isolated residential properties. • Change to views from public rights of way. • Change to views from Navenby Lane. • Change to views from Bloxham Woods Local Nature Reserve Footpath. • Change to views from Church Lane, Church and properties at Brauncewell. • Change to views from minor roads to Temple Bruer and Thompsons Bottom Farm. • Change to views from the A15, B1191, B1188 and B1189.	• A comprehensive landscape scheme will detail any mitigation planting that will be required and will be developed to integrate the Proposed Development into the receiving landscape, which will be secured via a requirement to the Development Consent Order. The landscape scheme will be submitted in support of the Development Consent Order application. • Within the landscape scheme, particular attention will be given to mitigating the effects of the Springwell Substation and Battery Energy Storage System on the public rights of way and lanes north west between A15 and Wellingore Heath. This may involve more structural planting and potentially landform alteration.
Summary of likely residual effects	
• Residual effects during construction/decommissioning on the following landscape and visual receptors are likely to be **not significant**: - Scopwick, Kirkby Green and Blankney (including recreational receptor locations therein); - Ashby de la Launde; - Public rights of way between the railway on the eastern boundary of the Site and the B1189;	

- Public rights of Way and lanes between Heath Road, Bloxholm Lane and Green Man Lane extending up to the A15 north of RAF Digby;
- Public rights of way between Bloxholm, Ashby de la Launde and Heath Road;
- Church Lane, Church and properties at Brauncewell;
- Ridge and Furrow Trail (linear route);
- Viking Way and High Dike (linear route);
- A15 trunk road (linear route);
- B1191 (Heath Road) (linear route);
- B1188 (linear route); and
- B1189 (linear route).

- Residual effects during construction and decommissioning on the following landscape receptors are likely to be **significant**:
  - Landscape Character Areas (LCA 7, LCA 11);
  - RAF Digby (including recreational receptor locations therein);
  - Individual/isolated residential properties;
  - Public rights of way between Blankney, Scopwick and Kirkby Green extending up to Blankney Walks Lane and the railway on the eastern Site boundary;
  - Public rights of way between RAF Digby and B1188 (Footpath R5/1);
  - Navenby Lane;
  - Bloxholm Woods Local Nature Reserve footpath;
  - Public rights of way and lanes south west between A15 and Brauncewell;
  - Minor roads to Temple Bruer and Thompsons Bottom Farm;
  - Public rights of Way and lanes north west between A15 and Wellingore Heath including New England Lane and Gorse Hill Lane; and
  - Spires and Steeples Trail (linear route).
- Residual effects during operation on the following landscape and visual receptors are likely to be **not significant**:
  - Scopwick, Kirkby Green and Blankney (including recreational receptor locations therein);
  - Ashby de la Launde;
  - Public rights of way between the railway on the eastern boundary of the Site and the B1189;
  - Public rights of Way and lanes between Heath Road, Bloxholm Lane and Green Man Lane extending up to the A15 north of RAF Digby;
  - Public rights of Way between Bloxholm, Ashby de la Launde and Heath Road;
  - Church Lane, Church and properties at Brauncewell;
  - Ridge and Furrow Trail (linear route);

- Viking Way and High Dike (linear route);
- A15 trunk road (linear route)
- B1191 (Heath Road) (linear route);
- B1188 (linear route); and
- B1189 (linear route).

- Residual effects during operation on the following landscape and visual receptors are likely to be **significant**:
  - Landscape Character Areas (LCA 7, LCA 11);
  - RAF Digby (including recreational receptor locations therein);
  - Individual/isolated residential properties;
  - Public rights of way between Blankney, Scopwick and Kirkby Green extending up to Blankney Walks Lane and the railway on the eastern Site boundary;
  - Public rights of way between RAF Digby and B1188 (Footpath R5/1);
  - Navenby Lane;
  - Bloxholm Woods Local Nature Reserve footpath;
  - Public rights of way and lanes south west between A15 and Brauncewell;
  - Minor roads to Temple Bruer and Thompsons Bottom Farm;
  - Public rights of way and lanes north west between A15 and Wellingore Heath including New England Lane and Gorse Hill Lane; and
  - Spires and Steeples Trail (linear route).

The potentially significant effects identified above will be reviewed as part of the ongoing design development.

Land, Soils and Groundwater	
Likely effects during construction	**Additional mitigation during construction**
• Localised contamination of soils. • Minor damage to field drains. • Effects on groundwater quality of the underlying aquifer and source protection zone. • Compaction and deterioration of soils and agricultural land.	• The Construction Environmental Management Plan will set out measures to avoid, minimise or mitigate effects on the environment during construction, including procedures to mitigate against erosion and contaminated land as well as requirements for pollution prevention and emergency procedures to manage accidental spillages and leaks. The Construction Environmental Management Plan will be secured via requirements to the Development Consent Order. An outline of the Construction Environmental Management Plan will be submitted in support of the Development Consent Order application.

	• 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. • Measures to manage any potential impacts to the soil (and agricultural land) during and on completion of construction will be documented within the Soil Management Plan, which will be secured via a requirement in the Development Consent Order application. An outline of the Soil Management Plan will be submitted in support of the Development Consent Order application.
Likely effects during operation	**Additional mitigation during operation**
• Land contamination. • Groundwater contamination as a result of maintenance works, cleaning, spillages, leaks or failure of the Battery Energy Storage System firewater bund. • Temporary impacts to soil and agricultural land. • Temporary change of land use of agricultural land, of which, approximately 44.3% of the area of solar development is classified as Best Most Versatile land.	• The Operational Environmental Management Plan will outline measures to prevent damage to the land during the operation, and will be secured via a requirement to the Development Consent Order. An outline of the Operational Environmental Management Plan will be submitted in support of the Development Consent Order application. • Pile depths would be minimised, where practicable, and areas of impermeable surfaces will be assessed in the Flood Risk Assessment and designed to ensure groundwater infiltration and any risk of groundwater flooding is mitigated. • A tanker would be required to remove firewater and so preventing the release of firewater to the surrounding environment. • Measures to ensure the quality of the land is maintained throughout the operational phase will be documented within the Soil Management Plan and the Operational Environmental Management Plan, which will be secured via requirements to the Development Consent Order. Outlines of the Soil Management Plan and Operational Environmental Management Plan will be submitted in support of the Development Consent Order application. The Soil Management Plan will 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.

	• A Battery Safety Commitments document, which will be submitted in support of the Development Consent Order application, will outline the requirements for the control and safety of the Battery Energy Storage System. These commitments will be secured via a requirement to the Development Consent Order. • Ecological mitigation and enhancements, which would include planting, including establishment of grassland and wildflowers, would help to reduce soil degradation and erosion. This would be managed through the implementation of the Landscape and Ecological Management Plan, which will be secure via a requirement to the Development Consent Order. An outline of the Landscape and Ecological Management Plan will be submitted in support of the Development Consent Order application.
Likely effects during decommissioning	**Additional mitigation during decommissioning**
• Minor localised contamination of soils related to potential spills. • Compaction and deterioration of soils and agricultural land. • Minor damage to field drains which may affect the localised drainage of the agricultural land and the groundwater quality. • Groundwater contamination as a result of spillages and leaks of fuels, oils and chemicals.	• The Decommissioning Environmental Management Plan, which will be secured via a requirement to the Development Consent Order, will be implemented by the contractor for the duration of the decommissioning works including best practice procedures to mitigate against erosion and contaminated land, as well as requirements for pollution prevention and emergency procedures to manage accidental spillages and leaks. • An outline of the Decommissioning Environmental Management Plan will be submitted in support of the Development Consent Order application.
Summary of likely residual effects	
Residual effects on land contamination during construction, operation and decommissioning are likely to be **not significant**. Residual effects on groundwater during construction, operation and decommissioning are likely to be **not significant**. Residual effects on soils and agricultural land during construction and decommissioning are likely to be **not significant**. However, likely residual effects during operation are considered to be **potentially significant**.	

Noise and Vibration	
Likely effects during construction	**Additional mitigation during construction**
• Construction noise. • Construction vibration. • Increase in daytime noise levels generated by construction traffic.	• Best Practicable Means will be implemented. These include (amongst others): - Careful selection of plant and construction methods; - Design and use of site enclosures, housing and temporary stockpiles, where practicable and necessary; - Plant and equipment likely to create noise and/or vibration whilst in operation will be located away from sensitive receptors, where practicable; - Low vibration working methods; - Controlling vibration at source; - Apply appropriate offset to building locations; and - Traffic routes to be designed as to avoid, where practicable, residential properties situated along minor roads. Traffic routes will be outlined in the Construction Traffic Management Plan, which will be secured via a requirement to the Development Consent Order. An outline of the Construction Traffic Management Plan will be submitted in support of the Development Consent Order application. • Noise and vibration management measures would be prescribed in the Construction Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. An outline of the Construction Environmental Management Plan will be submitted in support of the Development Consent Order application.
Likely effects during operation	**Additional mitigation during operation**
Noise from operational plant items likely to exceed the Significant Observed Adverse Effect Level.	Implementation/adoption of further acoustic mitigation measures as part of the ongoing design, to include: - Reducing the number of plant items; - Reducing noise at source through refinement of the engineering requirements in order to adopt lower noise emitting operational plant items; - Increasing the distance between source and receiver; - Use of barriers and/or enclosures where possible; and

	- Refinement of operational regimes to reduce noise impact during the quietest parts of the day.
Likely effects during decommissioning	**Additional mitigation during decommissioning**
The likely noise and vibration impacts during the decommissioning phase are considered to be similar to the construction phase, as it is envisaged that similar plant and works would be used.	Noise and vibration management measures would be prescribed in the Decommissioning Environmental Management Plan, which will be secured via a requirement in the Development Consent Order. An outline of the Decommissioning Environmental Management Plan will be submitted in support of the Development Consent Order application.
Summary of likely residual effects	
Residual noise and vibration effects during construction and decommissioning are likely to be **not significant** with the application of the above best practice control measures. Residual noise effects on receptors for Option 1a and 1b (Battery Energy Storage System located within the northern option) during operation are likely to be **not significant**. Residual noise effects on receptors for Option 2a and 2b (Battery Energy Storage System located within the southern option) during operation are likely to be **significant**. Further design and mitigation work is ongoing to reduce the effects of noise on receptors, which includes reviewing the size and location of the Battery Energy Storage System, alongside consideration of potential mitigation measures such as acoustic barriers.	
Traffic and Transport	
Likely effects during construction	**Additional mitigation during construction**
• Road safety. • Severance of public rights of way. • Increase in traffic volumes which could have potential effects on driver delay, road safety, severance and non-motorised users. The **Preliminary Environmental Information Report** identifies a number of road network receptors. For specific details of the likely effects and mitigation for each section of the road network, please refer to **Table 12.12** of this **Preliminary Environmental Information Report**.	• The Construction Traffic Management Plan will likely include the following measures: - Access and parking arrangements for site personnel, contractors and visitor arrangements for delivery and removal of materials; - Arrangements for loading, unloading and storage of plant and materials; - A scheme for routing and control of traffic associated with the construction and temporary signage during the construction phase; - Implementation programme including the proposed construction period and hours of operation; and - Details of any additional management measures, including details of wheel washing facilities and condition surveys.

	• Subject to the outcome of further assessments, potential mitigation could include junction and crossing improvements and public right of way protection or temporary closure/diversions. • A Travel Plan will be implemented to set out strategies to encourage the use of sustainable transport for the construction workforce. This will include initiatives to increase car sharing, while other measures will be explored for the preparation of the Environmental Statement such as shuttle services and provision of staff parking facilities, as well as other measures to encourage a model shift away from private car use. • The Construction Traffic Management Plan and the Travel Plan will be secured via requirements to the Development Consent Order. • Outlines of the Construction Traffic Management Plan and the Travel Plan will be submitted in support of the Development Consent Order application.
Likely effects during operation	**Additional mitigation during operation**
Once the Proposed Development is operational, the effect on the local road system is expected to be minimal. As such, operational traffic impacts have not been included in the **Preliminary Environmental Information Report**.	No additional mitigation measures are required.
Likely effects during decommissioning	**Additional mitigation during decommissioning**
Impacts during the decommissioning phase are expected to be the same as, or not greater than, the construction phase.	The management of movement of decommissioning traffic will be documented within the Decommissioning Environmental Management Plan, which will be secured via a requirement to the Development Consent Order application. An outline Decommissioning Environmental Management Plan will be submitted in support of the Development Consent Order application. .
Summary of likely residual effects	
Residual traffic and transport effects during construction, operation and decommissioning are likely to be **not significant**.	

Water	
Likely effects during construction	**Additional mitigation during construction**
• Sedimentation and pollution of watercourses, which could degrade the receiving watercourses, which include the Metheringham Beck (Water Framework Directive classified waterbody). • Increased demand on water resources.	• Measures to control silt/soil laden runoff produced during construction will be documented within the Construction Environmental Management Plan and through the provision of a Surface Water Drainage Strategy. Measures would likely include: - the collection of surface water runoff from hard standing area in a sump; and - geotextile silt-fences around excavations and exposed ground. • If it is expected that water abstraction would exceed 20 cubic meters of water per day during the construction period, then additional water would be brought in by bowser to provide sufficient supply for construction activities. • Outlines of the Construction Environmental Management Plan and Surface Water Drainage Strategy will be submitted in support of the Development Consent Order application.
Likely effects during operation	**Additional mitigation during operation**
Increased demand on water resources.	• Measures to reduce the water potable water usage during operation will be documented within the Operational Environmental Management Plan, which will be secured via a requirement to the Development Consent Order. Measures would likely include: - dual flush systems on toilet facilities; and - best practice measures. • An outline of the Operational Environmental Management Plan will be submitted in support of the Development Consent Order application.
Likely effects during decommissioning	**Additional mitigation during decommissioning**
Sedimentation and pollution of watercourses, which could degrade the receiving watercourses, which include the Metheringham Beck Water Framework Directive classified waterbody.	• Measures to control silt/soil laden runoff produced during decommissioning activities will be documented within the Decommissioning Environmental Management Plan, which will be secured via a requirement to the Development Consent Order. Measures would include best practice

	procedures to mitigate against erosion, including the management of the timing and conditions of the decommissioning activities. • An outline of the Decommissioning Environmental Management Plan will be submitted in support of the Development Consent Order application.
Summary of likely residual effects	
Water residual effects during construction, operation and decommissioning are likely to be **not significant**.	
Glint and Glare	
Likely effects during operation	**Additional mitigation during operation**
Glint and glare impacts to road users, aviation, railway and residential receptors.	• Best practice mitigation strategies, which will likely include landscaping and hedgerow planting to fill existing gaps or other design changes, including layout modifications and alterations to the angles of the Solar modules, if required. • Landscape planting that is required to mitigate the glint and glare impacts will be documented within the Landscape and Ecology Management Plan, which will be secured via a requirement to the Development Consent Order. • An outline of the Landscape and Ecology Management Plan will be submitted in support of the Development Consent Order application.
Summary of likely residual effects	
Residual glint and glare effects on aviation and railway receptors during operation have been identified as **not significant**. The majority of the Proposed Development will have low or no glint and glare impacts. However, residual effects during operation have been identified for one property and a small section of the A15 on the northbound section, located in the south of Springwell West. The landscape strategy and design is being developed to remove moderate and above impacts, with the intention that the design of the Proposed Development to be submitted in support of the Development Consent Order application will produce low or no glint and glare impacts and the effects would be reduced to minor and **not significant**. A full glint and glare technical assessment will form an appendix to the Environmental Statement, as required by the Scoping Opinion, which will assess the submitted design and identify any required additional mitigation.	

Cumulative Effects

There is a potential for cumulative effects on cultural heritage, landscape and land, soils and groundwater. However, further information and engagement is required to inform the detailed assessment of cumulative effects.

Discussions with North Kesteven District Council and Lincolnshire County Council in relation to agreement on study areas and methodology for the assessment of cumulative effects (including agreement on the list of other projects) will be undertaken as part of the ongoing EIA process and will inform the assessment of cumulative effects to be reported within the Environmental Statement.

A high-level overview of potential cumulative effects, based on the short-listed projects presented in **Table 15.3**, **Chapter 15**, is provided in **Section 15.6** of this **Preliminary Environmental Information Report**.

1. Introduction

1.1. Purpose of Preliminary Environmental Information Report

1.1.1. The purpose of this Preliminary Environmental Information Report (PEIR) is to present a preliminary account of the likely significant environmental effects that have been identified to date for Springwell Solar Farm (hereafter, the 'Proposed Development') to inform the statutory consultation process, in accordance with the Planning Act 2008[1], Guidance on the pre-application process[2], the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations')[3] (Regulation 12) and the Planning Inspectorate's Advice Note 7[4].

1.1.2. This PEIR has been prepared to enable interested parties (including members of the public, local planning authorities and statutory bodies), to develop an informed view of the likely significant environmental effects of the Proposed Development and to help inform their consultation responses on the Proposed Development during this pre-application stage.

1.1.3. This PEIR outlines the environmental assessment work undertaken to date, the likely significant environmental effects identified to date, proposed embedded mitigation and residual significant environmental effects (taking onboard any additional mitigation proposed), based on the environmental baseline information currently available and the current design of the Proposed Development. This PEIR also details the further work that is required to inform the Environmental Statement (ES), which will be submitted as part of the Development Consent Order (DCO) application.

1.1.4. The design of the Proposed Development, as presented in this PEIR, has been informed by the ongoing environmental assessment process and consultation and engagement responses. **It does not represent the final design**. Further survey and design work is currently being undertaken to further inform the design of the Proposed Development. The feedback received from this statutory consultation process will also inform further development

[1] Planning Act 2008. Available online: https://www.legislation.gov.uk/ukpga/2008/29/contents
[2] Planning Act 2008: Guidance on the pre-application process. Available online: Preliminary pages - Template A (publishing.service.gov.uk)
[3] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available online: The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)
[4] Planning Inspectorate (June 2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environment Information and Environmental Statements (Version 7). Available online: Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements | National Infrastructure Planning (planninginspectorate.gov.uk)

of the design. The refined design of the Proposed Development will be reported and assessed within the ES.

1.2. Legislative and planning policy context

Planning Act 2008

1.2.1. The Proposed Development is defined as a Nationally Significant Infrastructure Project (NSIP) under Sections 14(1)(a) and 15(2)[5] of the Planning Act 2008, as it comprises:

- The construction or extension of an electricity generating station (Part 3, Section 14(1)(a)); and
- Its capacity is more than 50MW (Part 3, Section 15(2)(c)).

1.2.2. Therefore, an application for DCO pursuant to the Planning Act 2008 is required and will be sent to the Planning Inspectorate as the examining authority on behalf of the Secretary of State.

1.2.3. Section 104 of the Planning Act 2008 applies where a relevant National Policy Statement (NPS) has effect[6]. At present, the Proposed Development's energy generating technology (i.e., solar) is not specifically considered by an NPS. This means that, at present, the DCO application for the Proposed Development would be determined under Section 105 of the Planning Act 2008, which applies where no NPS has effect. Under Section 105, the Secretary of State must have regard to any local impact report, any matters prescribed in relation to the Proposed Development and any other matters which the Secretary of State thinks are both important and relevant.

1.2.4. However, the Government recently consulted on revised versions of the energy NPSs with the new versions anticipated to be published imminently. The consultation draft of NPS EN-3 (Renewable Energy) contains a chapter dedicated to solar energy technology. This PEIR has been drafted to include references to the draft NPSs. It is envisaged that the revised Energy NPSs will be adopted prior to the submission of the DCO application. Assuming

[5] Planning Act (2008). Available online: https://www.legislation.gov.uk/ukpga/2008/29/section/14.
[6] On the 22nd November 2023 the Secretary of State for Energy Security and Net Zero presented five revised Energy National Policy Statements for parliamentary approval. These include revised Overarching National Policy Statement for Energy (EN-1), National Policy Statement for Renewable Energy Infrastructure (EN-3) and National Policy Statement for Electricity Networks Infrastructure (EN-5). At the time of writing this PEIR, Parliament is now considering these revised NPSs following which it is anticipated that they will be designated. Once designated, the 2011 National Policy Statements will no longer be policy and any reference in this PEIR to the 'currently adopted National Policy Statements' should be read accordingly. As a result of the publishing of the revised NPSs on the 22nd November 2023, the March 2023 draft NPSs are no longer the "Draft NPS"; however, this was not the case at the time of the rest of this PEIR being written. As such, the rest of this PEIR continues to refer to the March 2023 publication of the draft NPSs as the 'Draft NPSs'. In any event there are minimal changes in respect of solar PV assessment principles between the March 2023 draft EN-3 NPS and the November 2023 revised EN-3 NPS.

that occurs, then the technology specific policy will be in place and Section 104 of the Planning Act 2008 would apply.

1.2.5. In accordance with Section 104(2) of the Planning Act 2008, the Secretary of State is required to have regard to any relevant NPS amongst other matters, when deciding whether or not to grant a DCO. The relevant NPS would be the newly adopted NPS EN-3.

1.2.6. If granted, the DCO will provide planning consent for development and additional consents and authorisation, where specified, removing the need for some consents (such as planning permission).

1.2.7. Section 115 of the Planning Act 2008 also states that a DCO can include consent for 'associated development', which is development that is not a NSIP in its own right but is associated to the Proposed Development.

Currently adopted National Policy Statements

1.2.8. The Overarching National Policy Statement for Energy (NPS EN-1) (2011)[7] sets out the national policy for delivering major energy infrastructure in England and Wales. For renewable energy projects, NPS EN-1 has effect in combination with the relevant technology-specific NPS, National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[8], and together, they provide the primary basis for decisions made by the examining authority.

1.2.9. Part 3 of NPS EN-1 identifies the need for nationally significant energy infrastructure. With regards to decision making, paragraph 3.1.1. of NPS EN-1 states how *"the UK needs all the types of energy infrastructure covered in this NPS in order to achieve energy security at the same time as dramatically reducing greenhouse gas emissions"*.

1.2.10. NPS EN-3, taken together with NPS EN-1, provides the primary basis for decisions by the examining authority on applications it receives for nationally significant renewable energy infrastructure.

1.2.11. NPS EN-3, whilst providing an assessment and technology-specific information on certain renewable energy technologies, does not include solar farm development because utility-scale solar development was not feasible at the time of publishing NPS EN-3.

[7] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[8] National Policy Statement for Renewable Energy (EN-5) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure

Draft National Policy Statements

1.2.12. In March 2023, the Department for Energy Security and Net Zero published updated drafts of the NPSs for Energy. The consultation on these revised drafts was recently extended to the end of June 2023, and the Government has indicated its intentions for them to be designated as soon as possible after the close of the consultation; this could be the end of this year or early 2024, subject to the parliamentary process.

1.2.13. The key draft NPSs relevant to the consideration of Proposed Development are as follows:

- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[9]; and
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[10].

1.2.14. Strategic UK Government Policy has an overwhelming focus on delivering the change in energy generation and usage that will ensure that the UK meets its legally binding target of Net Zero by 2050. The Draft NPSs for Energy Infrastructure further emphasise the importance of solar in the UK's future energy mix and the benefits of the rapidity of its deployment in helping the UK meet Net Zero and increase energy security of supply.

1.2.15. In a planning-specific context, the suite of Draft NPSs further strengthen the need for the timely delivery of new renewable energy sources. Para 3.10.2 of Draft NPS EN-3 stresses the importance of solar in delivering the Government's goals for greater energy independence. It references the British Energy Security Strategy, which states that the government expects a five-fold increase in solar deployment by 2035 (up to 70GW).

1.2.16. In terms of transitional arrangements for a suite of Draft NPSs, the consultation document published alongside the Draft NPSs, Consultation: Planning for New Energy Infrastructure (2023)[11], advises:

1.2.17. *"The Secretary of State has decided that for any application accepted for examination before designation of the updated energy NPSs, the original suite of energy NPS should have effect. The amended energy NPSs will therefore only have effect in relation to those applications for development consent accepted for*

[9] 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

[10] Draft National Policy Statement for Renewable Energy (EN-5) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements

[11] Consultation: Planning for New Energy Infrastructure (2023). Available online: Planning for New Energy Infrastructure: revised draft National Policy Statements (publishing.service.gov.uk)

examination after the designation of the updated energy NPSs. However, any emerging draft energy NPSs (or those designated but not having effect) are potentially capable of being important and relevant considerations in the decision-making process. The extent to which they are relevant is a matter for the relevant Secretary of State to consider within the framework of the Planning Act and with regard to the specific circumstances of each development consent order application."

1.2.18. As stated above, the Applicant considers that the Draft NPSs should be adopted by the time the DCO Application is submitted for acceptance.

National planning policy Framework

1.2.19. Under both Section 104 and Section 105 of the Planning Act 2008, the Secretary of State must have regard to other matters which the Secretary of State considers are important and relevant, which will include national and local planning policy, for example, the revised National Planning Policy Framework (NPPF)[12]. The NPPF also provides relevant context for individual factor assessments.

1.2.20. The NPPF was published by the Department for Levelling Up, Housing & Communities (formerly the Department for Communities and Local Government) in March 2012 and was updated in September 2023. The NPPF sets out the Government's planning policies and how these are expected to be applied in England.

1.2.21. The NPPF does not contain specific policies for NSIPs; however, Chapter 2 of the NPPF, 'Achieving sustainable development' sets out that the planning system should contribute to the achievement of sustainable development, considering economic, social and environmental roles.

Local planning policy

1.2.22. Local development plans do not carry the same weight under the Planning Act 2008 in respect of decision-making for NSIPs as they do with determining planning applications made pursuant to the Town and Country Planning Act 1990. The afore-mentioned NPSs are the primary consideration for NSIP applications. Nevertheless, a local development plan is still a matter that can be considered important when determining an application for an NSIP. However, in the event of any conflict, the NPS prevails.

1.2.23. The Proposed Development lies within the areas for which North Kesteven District Council and Lincolnshire County Council are the responsible relevant local planning authorities. Therefore, the relevant local planning policies of the adopted local development

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

plans for each of the 'host' planning authorities will be considered part of the assessment. Local planning documents relevant to the Proposed Development comprise the following:

Lincolnshire County Council

- Lincolnshire County Council Minerals and Waste Plan (adopted 2016)[13]
- Lincolnshire County Council Green Masterplan 2020 – 2025 (adopted 2020)[14]
- Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050[15]
- Local Transport Plan 5 (LTP 5), Lincolnshire County Council (2022)[16]

North Kesteven District Council

- Central Lincolnshire Local Plan Policy 2018-2040 (adopted 2023)[17]

Consideration of planning policy in EIA

1.2.24. Within the ES, each environmental factor chapter will reference the national and local planning policies relevant to their topic of assessment. The PEIR does not consider the planning balance of the Proposed Development in line with the planning policy. This will be undertaken and set out in the Planning Statement, which will be submitted as a standalone document in support of the DCO application.

EIA Regulations 2017

1.2.25. The Proposed Development is considered to be 'EIA development', as defined by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (the 'EIA Regulations')[18].The Applicant notified the Secretary of State under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an ES in respect of the Proposed Development and by virtue of Regulation 6(2)(a)[19]

[13] https://www.lincolnshire.gov.uk/planning/minerals-waste
[14] https://www.lincolnshire.gov.uk/homepage/128/green-masterplan
[15] https://www.lincolnshire.gov.uk/directory-record/63754/flood-risk-and-water-management-strategy
[16] https://www.lincolnshire.gov.uk/downloads/file/7200/local-transport-plan-5
[17] https://www.n-kesteven.gov.uk/planning-building/planning/planning-policy/central-lincolnshire-local-plan-2018-2040
[18] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available online: The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)
[19] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, Regulation 6(2)(a). Available online: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk).

the Proposed Development is considered 'EIA development', thus requiring an Environmental Impact Assessment ('EIA').

1.2.26. Regulation 12 of the EIA Regulations requires the Applicant to set out in its Statement of Community Consultation ('SOCC') how it intends to publicise and consult on preliminary environmental information relating to the Proposed Development.

1.2.27. Regulation 12(2) of the EIA Regulations states that the purpose of the PEIR is to provide information reasonably required to enable consultees to develop an informed view of the likely significant environmental effects of the development being proposed. The Planning Inspectorate's Advice Note 7[20] (Section 8.4) states that there is no prescribed format as to what preliminary environmental information should comprise and it is not expected to replicate or be a draft of the ES. However, it also states that if the Applicant considers this to be appropriate (and more cost-effective), it can be presented in this way.

1.2.28. Following the completion of the surveys, assessments, and consultation and engagement as detailed in this PEIR, a DCO application will be made to the Secretary of State for determination in accordance with the Planning Act 2008. The DCO application will be accompanied by an ES, in accordance with Regulation 5(2)a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009[21]. The ES will set out the methods and findings of a comprehensive EIA undertaken in line with the EIA Regulations.

1.3. The Applicant

1.3.1. The Applicant, Springwell Energyfarm Limited, is a joint venture between EDF Renewables and Luminous Energy.

1.3.2. EDF Renewables UK, subsidiary of EDF Group, is one of the world's largest low carbon electricity companies. EDF has an operating portfolio of 41 renewable energy sites including battery, onshore and offshore wind (together totalling more than 1GW) which is providing much needed affordable and low carbon electricity. EDF's investment and innovation is reducing costs for customers and bringing significant benefits for communities. EDF

[20] Planning Inspectorate (June 2020) Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environment Information and Environmental Statements (Version 7). Available online: Advice Note Seven: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements | National Infrastructure Planning (planninginspectorate.gov.uk) https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-seven-environmental-impact-assessment-process-preliminary-environmental-information-and-environmental-statements/

[21] Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations (2009). Available online: The Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 (legislation.gov.uk)

invests in projects and the communities where they operate for the long term. EDF remains involved in projects over their lifetime from development, construction and operation, all the way through to decommissioning.

1.3.3. Luminous Energy, founded in 2013, is an established UK-based renewable energy developer with projects in the UK, US, Chile and Australia. Luminous Energy is now regarded as a leading player in the market, having delivered 1GW of projects globally and with the company's core values of providing people around the world with affordable, renewable energy remaining firmly at the heart of the business.

1.4. Structure of the PEIR

1.4.1. This PEIR is structured as follows:

Volume 1 – PEIR

Provides details on the location and description of the Proposed Development, together with a preliminary account of the likely significant environmental effects that have been identified to date as a result of the construction, operation (including maintenance) and decommissioning of the Proposed Development.

Volume 2 – Supporting Figures

Comprises figures to support the information detailed in **Volume 1**. The supporting figures are provided in a separate volume to enable the figures to be shown at a suitable scale to aid access and interpretation.

Volume 3 – Supporting Reports

Comprises a set of supporting reports, which include technical survey reports and survey data, to support the environmental information detailed in **Volume 1**.

Volume 4 – Landscape Figures

Comprises annotated photosheets for the landscape and visual viewpoints to support the information detailed in **Chapter 9** of **Volume 1**.

2. Description of the Proposed Development

2.1. Introduction

2.1.1. This chapter provides an overview of the location of the Proposed Development and description of the Proposed Development for the purposes of identifying and reporting the preliminary likely significant environmental effects during construction, operation (including maintenance) and decommissioning.

2.1.2. The design of the Proposed Development has evolved (and will continue to evolve) throughout the environmental assessment process to avoid or minimise environmental effects and in response to consultation and engagement feedback, where appropriate. The evolution of the design of the Proposed Development to date is summarised in **Chapter 3**.

2.1.3. The installation, construction and decommissioning methods to be utilised, will, eventually, be determined by the appointed contractor(s). However, all works will be required to be undertaken within the parameters assessed for the Proposed Development. With this in mind, this PEIR (and the ultimate ES to be submitted in support of the DCO application) will represent a reasonable 'worst case' scenario, ensuring a robust assessment of the likely significant environmental effects. This chapter details the maximum and, where relevant, minimum parameters of the Proposed Development which have been assessed to determine the preliminary likely significant environmental effects for the purposes of this PEIR.

2.1.4. This chapter is supported by the following figures located in **Volume 2**:

- **Figure 1.1** – Location Plan;
- **Figure 2.1** – Environmental Features Plan;
- **Figure 2.2** – Site Boundary;
- **Figure 2.3** – Zonal Masterplan;
- **Figure 2.4** – Indicative Height Parameters Plan;
- **Figure 2.5** – Indicative Green Infrastructure Parameters Plan;
- **Figure 2.6** – Indicative Operational Access & Movement Parameters Plan;
- **Figure 2.7** – Indicative Cable Routes;
- **Figure 2.8** - Indicative Locations Suitable for the Main and Satellite Construction Compounds; and
- **Figure 2.9** – Indicative Construction Access Parameter Plan.

2.1.5. The main elements of the Proposed Development comprise the following:

- Solar PV development comprising;
  - Ground mounted Solar PV generating station. The generating station will include Solar PV modules and mounting structures;
  - Balance of Solar System (BoSS) which comprises; inverters, transformers, switchgear;
- Collector Compounds comprising; switchgear, transformers and an operation, maintenance and welfare unit;
- A project substation ('Springwell Substation') compound, which will include; substation, switching and control equipment, office/control/welfare buildings, storage areas, and provisions for vehicular parking and material laydown;
- Battery Energy Storage System (BESS) compound(s) including batteries and associated inverters, transformers, switchgear and ancillary equipment and their containers, enclosures, monitoring systems, air conditioning, electrical cables, fire safety infrastructure and welfare facilities;
- 400kV Grid Connection Corridor to connect the Springwell Substation and future National Grid Navenby Substation;
- Underground cabling to connect the Solar PV modules to the BoSS, Collector Compounds and to the Springwell Substation.
- Ancillary infrastructure works including; boundary treatments, security equipment, earthing devices, fencing, lighting, earthworks, surface water management, and any other works identified as necessary to enable the development;
- Landscaping, habitat management, biodiversity enhancement and amenity improvements; and
- Works to facilitate vehicular access to the Site.

2.1.6. The proposed extent of the Solar PV development and areas that are being considered for the location of the Collector Compounds, BESS and Springwell Substation are shown in **Figure 2.3**

2.1.7. The areas that are proposed for mitigation and enhancement or retained agricultural land are shown in **Figure 2.3** and **Figure 2.5**.

2.1.8. Each of the elements outlined above and their associated features are set out in the following sections within this chapter.

2.1.9. It should be noted that the National Grid Navenby Substation and National Grid connecting towers no longer form part of the Proposed Development. The PEIR has assessed appropriate

connections, including a siting zone for the Grid Connection Corridor, to allow Springwell to connect to a future National Grid Navenby Substation. The Site boundary has therefore been amended to include the siting zone for the Grid Connection Corridor. The Proposed Development remains materially the same as the proposed development which was subject to the Scoping Opinion, therefore the assessment is based upon this Opinion as there are no additional aspects or matters where a likely significant effect may occur.

2.1.10. National Grid Electricity Transmission (NGET) is working to identify the most appropriate location for their new substation; however, it is not now proposed to form part of the Springwell DCO application and consent. It is expected to be applied for by NGET in due course through the Town and Country Planning Act 1990 regime.

2.2. Location of the Proposed Development

2.2.1. The Site comprises approximately 1,971.45 hectares (ha) of land, located within the administrative boundary of North Kesteven District Council and Lincolnshire County Council.

2.2.2. The location of the Proposed Development is shown in **Figure 1.1**. The Site boundary, presented in **Figure 2.2**, is the anticipated maximum area of land that will be required to facilitate the construction, operation and decommissioning of the Proposed Development. The Site boundary may be subject to change in response to the statutory consultation process and as the design of the Proposed Development progresses.

2.2.3. The Site lies in close proximity to the settlements of Blankney, Scopwick, Kirkby Green, and Ashby de la Launde. The settlements of Metheringham, Ruskington, Navenby, and Digby are also located within 3km of the Site.

2.2.4. The Royal Air Force (RAF) Digby Station is located adjacent to the Site. The station is home to the tri-service Joint Service Signals Organisation, part of the Joint Forces Intelligence Group of Joint Forces Command. Flying at RAF Digby ceased in 1953.

2.2.5. The land within the Site boundary predominantly consists of agricultural fields, interspersed with hedgerows, small woodland blocks and farm access tracks. The hedgerows within the Site range between lengths of dense tall vegetation (shrub and tree species) and thin lines of vegetation with sporadic shrubs and trees present.

2.2.6. The land within the Site is currently used for agriculture. The fields typically contain dried grass, lucerne, maize, spring barley, sugar beet, winter barley, vining peas and winter wheat.

2.2.7. There is variation in the features immediately surrounding each of the distinct land parcels within the Site, as presented below and illustrated on **Figure 2.2**:

- **Springwell West:** Springwell West forms the southernmost part of the Site and is intersected by the A15. This area is characterised by relatively open agricultural landscape and lies adjacent to the Bloxham Wood Nature Reserve in the south east corner of the Site.
- **Springwell Central:** Springwell Central is located in the centre of the Site, providing connectivity between Springwell West and Springwell East. The parcel lies adjacent to RAF Digby and B1191 to the west, Ashby de la Launde to the south and relatively open agricultural fields to the east.
- **Springwell East:** Springwell East is bounded by the settlements of Scopwick to the south, Kirkby Green to the south east, Blankney in the north and the B1188 and a railway line to the east. The parcel is interspersed with small woodland plantations and hedgerows.

2.3. Project design parameters

2.3.1. The design of the Proposed Development is an iterative process informed by ongoing environmental assessment and consultation and engagement with statutory and non-statutory consultees.

2.3.2. In order to maintain flexibility in the design, it is the Applicant's intention to use the 'Rochdale Envelope' approach within parameter ranges. The Planning Inspectorate's Advice Note Nine 'Rochdale Envelope'[22] provides specific guidance to applicants on the degree of flexibility that could be considered appropriate under the Planning Act 2008 regime.

2.3.3. The Rochdale Envelope is an acknowledged way of dealing with an application comprising EIA development where details of a project have not been fully resolved by the time the application is submitted. The term is used to describe those elements of a scheme that have not yet been finalised, but can be accommodated within certain limits and parameters, allowing the likely significant environmental effects of a project to be presented as a reasonable 'worst case'. It also provides the opportunity to assess aspects of a development where the detailed design is to be developed by the Applicant and approved by the relevant defined authority under a DCO Requirement, subsequent to the DCO being made.

2.3.4. Furthermore, such flexibility may be useful where a slight change in the design or capacity of the Proposed Development is anticipated, but not yet certain. Therefore, it may be possible that a particular element of the design will be subject to on-going technological advancements. This is of particular importance to maintaining

[22] Planning Inspectorate (July 2018) Advice Note Nine: Rochdale Envelope (Version 3). Available online: Advice Note Nine: Rochdale Envelope | National Infrastructure Planning (planninginspectorate.gov.uk)

flexibility due to the rapid pace of change in solar PV and energy storage technologies.

2.3.5. The design parameters for each element of the Proposed Development are detailed within the following sections and these have been used to inform the assessment detailed within this PEIR. They comprise:

- Preliminary parameter plans, which define the broad extents within which development can take place, as detailed in **Figures 2.4**, **2.5** and **2.6**.
- Preliminary design principles as outlined below within **Chapter 2**, which define the detailed parameters for specific aspects of the Proposed Development.

2.3.6. A Zonal Masterplan is shown on **Figure 2.3** in accordance with the Preliminary parameter plans and Preliminary design principles. This will form the basis of Works Plans within the DCO application.

2.3.7. The refined design will be presented in the ES in support of the DCO application.

2.4. Ground mounted Solar PV Generating Station

Solar PV modules

2.4.1. Solar PV modules convert sunlight into electrical current (as DC). Solar PV modules, commonly known as solar panels, are made up of individual bifacial photovoltaic cells.

2.4.2. The Solar PV modules would contain bifacial cells which are located at the rear of the Solar PV module and are transparent (glass or polymer) so that each Solar PV module is exposed to light at the back and front to increase the energy generation.

2.4.3. The Solar PV modules are typically dark blue/black in colour and held together by a metallic frame. The Solar PV modules will have an anti-reflective coating.

2.4.4. The Solar PV modules are fixed to a mounting structure (see further details below) and are known as a ‘table’. Once the Solar PV modules are electrically connected together in groups they are known as ‘strings’. Various factors will help inform the number and arrangement of the solar PV modules and it is likely some flexibility will be required to accommodate for future technology developments.

2.4.5. The Solar PV modules would measure approximately 2.4m in length, 1.3m in width with a depth of up to 30mm and consist of a series of photovoltaic cells beneath a layer of toughened glass.

2.4.6. The Solar PV modules would be separated with a minimum row separation space of 3m. The spacing between the rows will vary

across the Site to minimise effects of overshadowing and to ensure optimal efficiency.

2.4.7. For the purposes of the preliminary assessment, we have assumed that there will be 1.5 million PV modules required, however, this is based on a reasonable worst case assumption. The total number and arrangement of solar PV modules will depend on the iterative design process and available technology at the time of construction.

Mounting structure

2.4.8. The Solar PV modules would typically be mounted on a galvanised steel structure supported by vertical posts, known as a mounting structure, as shown indicatively in **Plate 2.1** and **Plate 2.2**.

2.4.9. The posts would be mounted into the ground to a depth of up to approximately 2.5m using pile driven, drilled cast or micro pile methodology for installation. The site ground conditions will determine the appropriate anchoring system and depth for the posts. There is also an option for some structure legs to be supported by concrete footings to reduce piling depths, if required due to the ground conditions or to reduce impacts on areas of archaeological sensitivity.

2.4.10. The mounting structure would typically be built from anodised aluminium or steel.

2.4.11. The mounting structure carrying the Solar PV modules will be designed to face southwards on a fixed platform. The Solar PV modules would be angled at a tilt of 13 to 25 degrees from horizontal to optimise daylight absorption.

2.4.12. Once attached to the mounting structure, the minimum height of the lowest part of the Solar PV modules will be approximately 0.8m above the existing ground level (AGL) and the maximum height of the Solar PV modules will be 3.5m AGL, except in areas of flood risk where the maximum height will be up to 4m AGL.

2.4.13. The height for each Solar PV module can be influenced by several design factors including; flood risk (and associated historic flood levels), local topography, visual receptors, land use practices, and the Solar PV module type and configuration.

Plate 2.1 Example of a Solar PV module and mounting structure

Plate 2.2 Typical mounting structure

2.4.14. The different height parameters for the Solar PV modules across the Site are provided in **Figure 2.4**.

2.4.15. The preliminary Ground Mounted Solar PV Generating Station design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.1**.

Table 2.1 Preliminary Ground Mounted Solar PV Generating Station design principles

Component	Parameter type	Design Principle
Solar PV development	Maximum extent of Solar PV Generating Station	The maximum total extent of Solar PV development will be located in the areas defined on the Works Plans, which will be informed by the Zonal Masterplan shown on **Figure 2.3**.
Solar PV Module	Maximum height of Solar PV module AGL	3.5m except in areas of flood risk which will be at 4m AGL as displayed in **Figure 2.4**.
	Minimum height of Solar PV module AGL	0.8m AGL
	Dimensions	The Solar PV modules would measure up to approximately 2.4m in length, 1.3m in width with a depth of up to 30mm.
	Slope and angle	The Solar PV modules would be sloped towards the south, at a fixed angle of 13 to 25 degrees from horizontal.
	Module colour	The Solar PV modules would be dark blue or black in colour, or similar, held with a metallic frame structure.
	Solar PV Panel technology	Bifacial
	Minimum separation distances between rows	Minimum inter row spacing of 3m
Solar PV Mounting Structure	Depth of foundations	Up to approximately 2.5m
	Foundation type	Pile driven, drilled cast, micro pile, screw piles or concrete footings
	Mounting Structure material	Aluminium or galvanised steel

2.5. Balance of Solar System

2.5.1. The BoSS refers to the components and equipment that convert the DC electricity collected by the solar PV modules into alternating current (AC), comprising inverters, transformers, and switchgear.

2.5.2. As the design of the Proposed Development evolves, the configuration of the BoSS will be defined post-consent. This section also sets out the different configuration options available for the Proposed Development.

Inverters

2.5.3. Inverters are required to convert the DC electricity collected by the PV modules into AC, which allows the electricity generated to be exported to the National Grid. Inverters are sized to manage the characteristics of the DC electricity that is output from the Solar PV modules.

2.5.4. It is currently expected that either string or central inverters would be used. String inverters are small enough to be mounted underneath the modules, as shown indicatively in **Plate 2.3**.

Plate 2.3 Typical string inverter

2.5.5. String inverters are typically 1.2m in width, 0.9m in height and have a depth of approximately 400mm. A string inverter would be required for every PV string.

2.5.6. String inverters are typically white or light grey in colour.

2.5.7. Alternatively, centralised inverters may be used, as shown indicatively in **Plate 2.4**, which would be sited at regular intervals amongst the Solar PV modules. Centralised inverters would sit grouped together with the transformer and switchgear outside or within its own container compound as part of the Inverter Transformer Station (ITS) as detailed in **paragraphs 2.5.17 - 2.5.19** below.

Plate 2.4 Typical outdoor centralised inverter

Transformers

2.5.8. Transformers are required to step up the voltage of the electricity generated across the Site before it reaches the Springwell Substation or a Collector Compound. Transformers would be located at regular intervals across the Site, adjacent to the Solar PV Generating station. Transformers would be located standalone outdoors adjacent to the inverters and switchgear or housed indoors, alongside the inverters and switchgear within a container. A typical outdoor transformer is shown indicatively in **Plate 2.5**.

2.5.9. Transformers that are located outdoors are typically located in the same area as the standalone inverters and switchgear and as a compound would typically have a maximum footprint of 20m x 4m with a height of up to 3.5m.

Plate 2.5 Typical outdoor transformer

Switchgears

2.5.10. Switchgears are the combination of electrical disconnect switches, fuses or circuit breakers to control, protect and isolate electrical equipment. Switchgear is used both to de-energise equipment to allow work to be done and to clear faults downstream.

2.5.11. Switchgears are typically housed within a container with the transformer and/or inverter or can be located independently outdoors, adjacent to the outdoor transformer as shown indicatively in **Plate 2.6** below.

2.5.12. Switchgear that are located outdoors, typically located adjacent to the outdoor transformer will typically be sited within an area with a maximum footprint of 20m x 4m with a height up to 3.5m.

2.5.13. The switchgear would be located alongside the transformer and it is assumed that the ITS would contain the switchgear and have a footprint of 20m x 30m in plan and up to 6m in height.

Plate 2.6 Typical outdoor switchgear

Configuration options for BoSS

2.5.14. There are two options under consideration; independent outdoor equipment and ITS. Both options would be located within fields identified as suitable for the Ground Mounted Solar PV Generating Station and outside of Flood Zones 2 and 3.

2.5.15. As the design of the Proposed Development develops, the configuration will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES.

Independent outdoor equipment

2.5.16. As presented in **Plate 2.7**, with the independent outdoor equipment option, the centralised inverter, transformer and switchgear are located separate to each other outdoors. The approximate footprint for this option is up to 20m x 4m in plan, and up to approximately 3.5m in height.

2.5.17. It is anticipated that the independent outdoor equipment would sit on compacted hardcore material or concrete pad foundations.

Plate 2.7 Example of independent outdoor equipment

Inverter and Transformer Station

2.5.18. As shown indicatively in **Plate 2.8** with the ITS option, equipment (inverter, transformer and switchgear) is enclosed together within a container. Typically, within a field containing approximately 20MW of Solar PV Modules, there would be a requirement for approximately 4-8 ITS.

2.5.19. Each ITS is typically the size of a shipping container, approximately 6m x 3m in plan, and up to approximately 3m in height. The ITS containers would be dark green or grey in colour.

2.5.20. The ITS would sit on compacted hardcore material or concrete pad foundations.

Plate 2.8 Typical Inverter Transformer Station

2.5.21. The preliminary Balance of Solar System (inverter, switchgear and transformer) design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.2**.

Table 2.2 Preliminary BoSS design principles

Parameter type	Design principle
Configuration of BoSS	The BoSS comprises the inverter, transformer and switchgear. These would be grouped together within the same outdoor compound or within an ITS.
Type of inverter	There are two options including String or Central inverters. String inverters are located alongside each Solar PV Module or attached to the rear of the Module. Central Inverters are distributed at regular intervals amongst the Solar PV Modules as part of an outdoor compound or ITS.
Dimensions of string inverter	String inverters are typically 1.2m in width, 0.9m in height have a depth of approximately 400mm.
Number of string inverters	Assumed approximately 2700 string inverters.

Parameter type	Design principle
Number of central inverters	Assumed approximately 270 central inverters.
Type of transformer	Transformers may be independent outdoor units or be located within a container alongside the inverters and switchgear.
Dimensions of outdoor transformer, inverter and switchgear compound	There is an option for the inverter, transformer and switchgear to be placed outdoors and be independent of each other within the same outdoor compound. The approximate footprint for this option is up to 20m x 4m in plan, and up to approximately 3.5m in height.
Dimensions of ITS	Each ITS container would be approximately 6m x 3m in plan and up to 3m in height.
Colour of independent inverters, transformers and switchgear	Light grey, white, dark green or similar.
Colour of ITS	Dark green, grey or similar.
Number of ITS	Approximately 270 ITS would be required across the Site.
Indicative location	The location of the BoSS has not been defined and will be determined based upon environmental and technical factors. A reasonable worst case scenario will be assessed and presented in the ES. For the purposes of the preliminary assessment, it has been assumed that the BoSS equipment would be located in an ITS that would be located within each Solar PV field as marked in light blue on the Zonal MasterPlan provided in **Figure 2.3** but excluding Indicative Siting Areas for the BESS, Collector Compounds and Springwell Substation.

2.6. Collector Compounds

2.6.1. Consideration has been given to the potential use of Collector Compounds to manage the underground cabling across the Site and/or provide local maintenance facilities. It is anticipated that there would be a main Collector Compound located adjacent to the Springwell Substation and satellite Collector Compounds located within each Parcel. It is anticipated that there would be one satellite Collector Compound within both Springwell East and Springwell Central and up to two in Springwell West, as displayed in the Zonal Masterplan in **Figure 2.3**.

2.6.2. The Collector Compounds would receive the medium voltage (33kV) underground cables from the independent outdoor equipment and/or ITSs within the surrounding solar fields, depending on the final configuration. Underground cabling will then connect the Collector Compounds to the Springwell Substation.

2.6.3. The Collector Compounds may include switchgear and transformers to step up the voltage to 66kV. The switchgear and transformers would be located in a contained indoor unit or within a separate outdoor fenced area. The Collector Compounds would also include an operation, maintenance, security and welfare building, assumed to be single storey.

2.6.4. The Collector Compounds are expected to sit on shallow concrete pad foundations.

2.6.5. The containers are expected to be grey or dark green in colour. The buildings could be formed in grey or dark green containers, or may be brick or block built which may be rendered/painted to be sensitive to the local environment.

2.6.6. The satellite Collector Compounds are anticipated to be approximately 1,500m², with the maximum height of the equipment within each compound approximately 6m in height AGL.

2.6.7. The main Collector Compound is anticipated to be approximately 21,600m², with the maximum height of 6m AGL.

2.6.8. Based on the site selection work (further detail provided in **Chapter 3**), the potential areas within the Site considered suitable for the location of the Collector Compounds are presented in **Figure 2.3**.

2.6.9. The preliminary Collector Compound design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.3**.

Table 2.3 Preliminary Collector Compound design principles

Parameter type	Design principle
Satellite Collector Compound dimensions and height	Approximately 1,500m² and up to 6m in height AGL
Main Collector Compound dimensions and height	Approximately 21,600m² and up to 6m in height AGL
Colour	The collector compound containers would be grey, dark green or similar. The buildings will be formed in grey or dark green containers, or may be brick or block built and will be rendered/painted to be sensitive with the local environment.

Parameter type	Design principle
Indicative Location	**Figure 2.3** presents the potential areas within the Site considered suitable for the location of the Collector Compounds. For the purposes of the preliminary assessment, it has been assumed that one Collector Compound is located within each of the Indicative Siting Zones shown on the Zonal MasterPlan provided in **Figure 2.3**. Height parameters for the Collector compounds are up to 6m as shown in the Height Parameter Plan as outlined in **Figure 2.4**. Collector compound siting within an Indicative Siting Zone is assumed to be closest to the nearest sensitive receptor for that particular assessment.

2.7. Battery Energy Storage System

2.7.1. The Battery Energy Storage System (BESS) is designed to provide peak generation and grid balancing services to the electricity grid. It can do this by allowing excess electricity generated from the Solar PV Generating Station to be stored in batteries and dispatched when required. As a secondary function, it may also import surplus energy from the electricity grid when energy available to the grid exceeds demand.

Plate 2.9 Example BESS facility

2.7.2. The BESS typically comprises a number of container-sized units which would house the BESS batteries and associated equipment.

2.7.3. It is anticipated that each BESS and control and transformer containers would be up to 13.5m in length x 2.5m width and up to 6m in height AGL. The BESS containers would be up to approximately 3m in height and the associated electrical infrastructure would be up to 6m.

2.7.4. It is anticipated that the BESS compound would be up to 125,000 m². The defined number of BESS containers will depend upon the most appropriate design power output capacity and duration of energy storage required at the time of construction. For the purposes of the preliminary assessment, it has been assumed that there would be 1150 BESS containers and 385 BESS control and transformer containers within the BESS compound.

2.7.5. The BESS units each comprise of an enclosure for BESS electro-chemical components and associated equipment including transformers, inverters, switchgear, power conversion systems, monitoring and control system, Heating, Ventilation and Air Conditioning (HVAC) systems, electrical cables, fire safety equipment, water storage tanks and a shut off valve. An example of a BESS facility is shown in **Plate 2.9.**

2.7.6. The BESS may comprise DC/DC converters to control the charge of the batteries from the PV energy output and/or AC/DC inverters to control their charge using energy drawn from the National Grid.

2.7.7. Each BESS would require a heating, ventilation and cooling (HVAC) system to ensure the efficiency of the batteries, which are integrated into the containers. This may involve a HVAC system that is external to the containerised unit located either on the top of the unit or attached to the side of the unit. If this uses air to heat and cool, it would have a fan built into it that is powered by auxiliary power from an incoming supply from the grid.

2.7.8. A switchgear/control room operates, isolates and controls the exported power from the BESS. This would comprise a building of similar dimensions to one of the unit containers and will be located adjacent to the BESS within the same compound.

2.7.9. Welfare facilities and security gatehouses are likely to be located within the BESS compound.

2.7.10. The BESS would sit on shallow concrete pad foundations.

2.7.11. The BESS would be grey or dark green in colour and contained within a palisade fence for security measures.

2.7.12. The BESS containers are modular and will be configured to fit the field size, fit with the location of the Springwell Substation and respond to any environmental constraints. The configuration of the BESS will be detailed and assessed within the ES.

2.7.13. The BESS would be located in one centralised area.

2.7.14. The BESS would be located in close proximity to the Springwell Substation within the north of Springwell West or located in the fields to the southern extent of Springwell West.

2.7.15. The location and configuration of the BESS will be developed as the design of the Proposed Development progresses and will be informed by the EIA and consultee responses.

2.7.16. Based on the site selection work (further detail provided in **Chapter 3**), the potential areas within the Site considered suitable for the location of the BESS are presented in **Figure 2.3**.

2.7.17. The preliminary BESS design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.4**.

Table 2.4 Preliminary BESS design principles

Parameter type	Design principle
Dimensions and height of one BESS container unit or one control and transformer unit	The unit would be up to 13.5m in length x 2.5m width and up to 6m in height.
Compound dimensions	Up to 125,000m².
Colour	Grey, dark green or similar. The buildings would be formed in grey, dark green or may be brick or block built which would be rendered/painted to be sensitive to the local environment.
Foundations	Shallow concrete pad foundations.
Indicative locations	**Figure 2.3** presents the potential areas within the Site considered suitable for the location of the BESS. For the purposes of the preliminary assessment, it has been assumed that the BESS is either located within 1) Indicative Siting Zones in the north of Springwell West, OR 2) within the Indicative Siting Zone in the southern extent of Springwell West. Both options have been assessed. Height parameters for the BESS Indicative Siting Zone in the southern extent of Springwell West are up to 6m as shown in the Height Parameter Plan provided in **Figure 2.4**. Height parameters for the BESS Indicative Siting Zone in the north of Springwell West reflect the higher Springwell Substation (up to 12m).

Parameter type	Design principle
	BESS siting within an Indicative Siting Zone is assumed to be closest to the nearest sensitive receptor for that particular assessment.

2.8. Springwell Substation

2.8.1. The Proposed Development has secured a grid connection agreement to allow export and import of electricity to and from the National Grid by 2030. The Springwell Substation would facilitate the export and import of electricity from the Proposed Development to the National Grid. Further detail on the future National Grid Navenby Substation in provided in **paragraph 2.1.9 and 2.1.10** within this chapter.

2.8.2. The Springwell Substation would consist of electrical infrastructure such as the transformers, switchgear and metering equipment. The Springwell Substation would include a building which will comprise an office, control functions, warehouse, welfare and workshop facilities in one or more buildings with a total footprint of approximately 500m² and up to 6m in height AGL.

2.8.3. Switch rooms would also be housed within a single storey container building which is anticipated to be approximately 28m x 7m with a maximum height of 6m AGL.

2.8.4. The building would be a painted block building or of prefabricated construction with external colours and finishes sensitive to the landscape.

2.8.5. The Springwell Substation is expected to include up to six transformers to step up the voltage of the electricity generated across the Site. Each transformer would sit on a concrete stand with a low boundary wall. It is anticipated that the total footprint of the transformer would be 8m x 25m in plan with the transformer equipment up to 12m in height AGL.

2.8.6. Security gatehouses to facilitate two people are anticipated to be located within the Springwell Substation compound.

2.8.7. The footprint of the entire Springwell Substation compound is anticipated to be approximately 62,500m² with a height up to 12m AGL. The final configuration of the Springwell Substation will be detailed and assessed within the ES.

2.8.8. Based on the site selection work (further detail provided in **Chapter 3**), the potential areas for the location of the Springwell Substation are presented in **Figure 2.3**. The defined location of the Springwell Substation will be informed by ongoing design development, the EIA and consultee responses.

2.8.9. The preliminary Springwell Substation design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.5**.

Table 2.5 Preliminary Springwell Substation design principles

Parameter type	Design principle
Springwell Substation building (office, welfare, warehouse and workshop facilities) dimensions	Approximately 500m² in one or more buildings and up to 6m AGL in height.
Switchgear room dimensions	28m x 7m with a maximum height of 6m AGL.
Springwell Substation compound material	The control building is expected to be a painted block building or of prefabricated construction with external colours.
Dimensions of the main transformers	The bund in which each of the transformers would sit are anticipated to be approximately 8m x 25m, and up to approximately 12m AGL in height.
Springwell Substation compound	It is anticipated the overall Springwell Substation compound would be approximately 62,500m² with a height up to 12m AGL.
Indicative location	**Figure 2.3** presents the potential areas within the Site considered suitable for the location of the Springwell Substation. For the purposes of the Preliminary assessment, it has been assumed that the Springwell Substation is located within the A Zones shown on the Zonal MasterPlan as provided in **Figure 2.3**. Height parameters for Springwell Substation are up to 12m as shown in the Height Parameter Plan provided in **Figure 2.4**. Springwell Substation siting within Indicative Siting Zone A is assumed to be closest to the nearest sensitive receptor for that particular assessment.

2.9. Underground cabling

Grid Connection cabling

2.9.1. The electricity generated by the Proposed Development would be exported via 400kV underground cabling from the Springwell Substation to a new National Grid Substation.

2.9.2. The siting zone for Grid Connection Corridor is shown in **Figure 2.3**. The total length of the underground cabling is to be determined; however, for the purposes of this PEIR, it is assumed that the cable route would be up to 2km to the north of Gorse Hill Lane.

2.9.3. The Grid Connection cabling will avoid woodlands, watercourses and the area underneath the overhead line and will seek to avoid any impacts to high value trees and hedgerows. It is likely that the Grid Connection cabling would need to cross two minor roads.

2.9.4. The Grid Connection cabling, which forms part of the Proposed Development, exceeds 132kV and therefore has the potential to cause electromagnetic fields with adverse effects on human health. The Grid Connection cabling will be buried underground at a suitable depth in accordance with the relevant guidance[23]. Therefore, electromagnetic fields are unlikely to have any adverse effects on residential receptors.

2.9.5. The location of the Grid Connection cabling is subject to an iterative design process informed by ongoing environmental and engineering surveys, engagement with landowner(s) and engagement with stakeholders. The location of the Grid Connection cabling will be refined as engagement and the design progresses and will be presented in the ES.

2.9.6. The Grid Connection cabling would form a single circuit connection between the Springwell Substation and the National Grid Navenby Substation.

2.9.7. The cable trenches are expected to be up to approximately 2m wide and to a depth of approximately 1.5m, apart from in areas where cables would be joined at jointing bays (see **paragraph 2.9.14**) and in areas where cables would need to cross roads, utilities or ditches, where the depth may be greater. The exact depth of the cable trench in these locations is dependent on the nature and requirements of the feature that the cable route would need to cross, which will be determined as the engagement and design progresses.

2.9.8. Open-cut trenching methods will be used for the majority of the cable routing; however, subject to on-going engagement with utility providers and other stakeholders, there may be a requirement for specialist trenchless techniques (e.g. Horizontal Directional Drilling) for crossings of roads and to avoid or reduce impacts to environmental receptors.

2.9.9. The Grid Connection cabling working width would be up to 25m to account for the inclusion of the cable trench, two lane haul road for

[23] Department of Energy and Climate Change (2012). Demonstrating compliance with EMF public exposure guidelines: voluntary code of practice. Available online: Demonstrating compliance with EMF public exposure guidelines: voluntary code of practice - GOV.UK (www.gov.uk)

construction and maintenance access, space for temporary storage of topsoil and subsoil and working space between these features.

2.9.10. Jointing bays would be required along the Grid Connection cabling route to connect the lengths of the cable and to help with any maintenance and replacement requirements, should a fault develop.

2.9.11. The jointing bays would comprise a main jointing pit where the cables are joined, and a smaller link box which provides for connections between the cable screens. There may also be a small fibre optic chamber adjacent to the link box, if fibre optic communications cables need to be joined.

2.9.12. It is anticipated that the cables would need to be joined at every 500-800m in a jointing bay. The jointing bay would be approximately 5.5m in width, 20m in length and up to approximately 2.5m in depth.

2.9.13. These would be buried underground and would typically include concrete chambers with concrete or metal inspection covers. For example, the jointing bay may have concrete slab floors or one or more concrete chambers, and may include concrete roof slabs to facilitate maintenance access.

2.9.14. The jointing bays would be positioned at the field boundaries, as far as practicable, to reduce the impact on agricultural activities.

2.9.15. The preliminary Grid Connection cabling design principles that have been assumed for the purposes of this preliminary assessment are detailed in **Table 2.6**.

2.9.16. The PEIR assessment is based on the siting zone of the Grid Connection Corridor presented in **Figure 2.3** and design principles presented in **Table 2.6**. The Grid Connection cabling within the siting zone presented in **Figure 2.3** is assumed to be closest to the nearest sensitive receptor for that particular assessment to ensure a reasonable worst case scenario.

Table 2.6 Preliminary Grid Connection cabling design principles

Parameter type	Design principle
Maximum width of the cable trench	The cable trench would be up to 2m wide
Depth of the cable trench	Approximately 1.5m in depth, except when the cable routes need to cross roads, ditches or known utilities, where the depth may be greater.
Maximum Grid Connection cable working width	Up to 25m to account for the inclusion of the cable trench, two lane haul road for construction and maintenance access, space for temporary storage of topsoil and subsoil and working space between these features

Parameter type	Design principle
Joint bay	Approximately 5.5m in width, 20m in length and up to approximately 2.5m in depth.

Cabling

2.9.17. Low voltage electrical cabling is required to connect the Solar PV modules to inverters (typically via 1.5/1.8kV cables), and the inverters to the transformers (typically via 0.6/1kV cables). Higher rated cables (around 33kV) are then required between the transformers and the switchgears and from switchgears (Collector Compounds) to the electrical infrastructure within the Springwell Substation and BESS.

2.9.18. Cabling will be laid underground, apart from cabling between the Solar PV modules and string inverters. The dimensions of the trenches will vary depending on the number of circuit ducts they contain and therefore could be up to 19m wide in some locations across the Site which would be limited to areas where there are large numbers of circuit ducts, typically adjacent to the Springwell Substation and main Collector Compound. The cabling is expected to be up to approximately 2m in depth, apart from in areas where utilities, road or ditch crossings may be required.

2.9.19. It is anticipated the working width for the cable route construction will be approximately 5m on either side of the trench. It has therefore been assumed that the maximum cable route corridor width would be up to 29m in width.

2.9.20. Open-cut trenching methods will be used for a majority of the cable routing. However, subject to on-going engagement with utility providers and other stakeholders, there may be a requirement for specialist trenchless techniques (e.g. Horizontal Directional Drilling) for crossings of roads such as the A15, environmental receptors, and other existing infrastructure.

2.9.21. Data cables are anticipated to be installed alongside the electrical cables to allow monitoring of the infrastructure during the operational phase of the Proposed Development.

2.9.22. Based on the site selection work (further detail provided in **Chapter 3**), the indicative options for the location of the main cable route connection to the Springwell Substation are displayed in **Figure 2.7**. This PEIR has based the assessment on all of the cable route options that are identified in **Figure 2.7** to be taken forward to assume a worst case approach. The defined location of the cable routes will be informed by ongoing design development, the EIA and consultee responses.

2.9.23. The preliminary cabling design principles that have been assumed for the purposes of this preliminary assessment are detailed in **Table 2.7**.

Table 2.7 Preliminary cabling design principles

Parameter type	Design principle
Maximum width of the cable trench	The trenches would be up to 19m wide in some locations across the site which would be limited to areas where there are large numbers of circuit ducts, typically adjacent to the Springwell Substation and main Collector Compound. There would be a 5m working width on either side of the trench. It has therefore been assumed that the maximum cable route corridor width would be up to 29m in width.
Maximum depth of the cable trench	Up to approximately 2m in depth, except when the cable routes need to cross roads, ditches or known utilities.

2.10. Ancillary infrastructure works

Fencing and security

2.10.1. Security fencing would enclose the operational areas of the Proposed Development. The fields encompassing the Solar PV modules and supporting infrastructure will likely be fenced using 'deer-proof fencing' which is formed of wooden posts and wire mesh, which typically would be 2.5m in height and up to a maximum height of 3m.

2.10.2. It is proposed that mammal gates would be included in the deer-proof fencing to allow other wildlife to move across the Site.

2.10.3. The location of the security fencing is likely to be positioned close to the infrastructure allowing an offset of at least 10m from trees and hedgerows, where practicable, to avoid any impact to tree root zones and to provide a biodiversity corridor. The defined location of the security fencing is still to be determined.

2.10.4. Palisade fencing would be installed around the perimeter of the Springwell Substation compound, BESS, Collector Compounds and Grid Connection cable jointing bays. Palisade fencing is made of steel rails attached to horizontal-running rails, connected to vertical steel joints. It is anticipated that the fencing will be up to 3m in height.

2.10.5. Pole mounted facing closed circuit television (CCTV) systems which typically have a maximum height of 5m are assumed to be positioned around the perimeter of the operational areas of the Site with fixed views of the Proposed Development as a security

measure. The CCTV would be positioned in the locations including the Ground Mounted Solar PV Generating Station, BESS, Collector Compound and Springwell Substation compound and will not be positioned in view of any residential properties. CCTV lighting will be infrared (not visible).

2.10.6. The Springwell Substation compound, BESS compound, and Collector Compounds is assumed to include manually operated lighting, in accordance with relevant standards. No areas of the Site are assumed for the purposes of the preliminary assessment to be permanently lit.

2.10.7. The lighting design will be directional and only operated in case of emergency or when needed during maintenance works being undertaken during hours of darkness.

2.10.8. The preliminary fencing and security design principles that have been assumed for the purposes of the preliminary assessment are detailed in **Table 2.8**.

Table 2.8 Preliminary fencing and security design principles

Component	Parameter type	Design principle
Fencing	Type	Deer-proof fencing would be installed around the operational areas of the Proposed Development. Palisade Fencing would be installed around the perimeter of the Springwell Substation compound, BESS, Collector Compounds and Grid Connection Jointing Bays.
	Maximum height	The deer-proof and palisade fencing would have a maximum height of 3m.
Security	Type	Pole mounted closed CCTV systems.
	Maximum height	The pole mounted CCTV would have a maximum height of 5m.

Drainage

2.10.9. The Solar PV modules would not increase the impermeable area, and therefore are not anticipated to increase the volume of surface water runoff. The Solar PV modules will be separated by a rainwater gap to allow rainwater to drain feely to the ground between the panels helping to replicate the greenfield runoff conditions.

2.10.10. Drainage and sewage systems are likely to be required at the Springwell Substation compound and BESS compound due to the

increase in impermeable hard standing material that would form the base for the equipment.

2.10.11. A detailed operational drainage design will be carried out pre-construction to account for the areas of hardstanding at the Springwell Substation and BESS.

2.10.12. The design of new drainage systems will be based on the Flood Risk Assessment (FRA) and hydrological assessment which will determine the requirement and location for sustainable urban drainage systems. The FRA will be submitted in support of the DCO application.

2.10.13. Infiltration drainage design will be in accordance with Building Research Establishment (BRE) Digest 365: Soakaway Design and Sewers for Adoption.

2.10.14. To ensure potentially contaminated runoff does not enter the wider hydrological network, a system would be installed to isolate and contain any firewater runoff in the event of an emergency. This would likely include the use of a system which can stop surface water discharge offsite within the onsite drainage network. The potentially contaminated runoff would then be contained within an underground attenuation tank prior to being collected and tankered offsite to be suitably tested and disposed.

Internal site access tracks

2.10.15. It is assumed that the access tracks within the Site for internal access and transportation would follow the alignment of existing agricultural tracks, where possible. The access tracks would typically be constructed of permeable materials such as gravel and would have a running width of up to approximately 6m.

Works to facilitate vehicular access to the Site

2.10.16. The primary point of construction and operational access to the Site is assumed to be directly from or via the A15 Sleaford Road, utilising the existing B1191. Further work which includes a swept path analysis of the preferred field access locations has been undertaken to understand if there is a requirement for any street works to the public highway (or adjoining land) to accommodate heavy goods vehicles (HGV) or abnormal indivisible loads (AIL). The layout of field accesses has been checked and geometrical changes to the access layouts will be incorporated and included in the developing design, where necessary. The Gorse Hill Lane junction with the A15 Sleaford Road will require improvement to safely facilitate vehicle movements to/from the Springwell Substation for articulated HGVs and AILs, which form part of the Proposed Development.

2.10.17. The HV transformers can weigh up to approximately 200 tons; therefore, it is assumed that concrete or tarmac roads would be installed from the main site entrance to the Springwell Substation.

2.10.18. Temporary access tracks would be provided to link the temporary construction compounds to the Site access points. It is anticipated that onsite access tracks would follow the existing agricultural tracks, where possible, to limit the soil disturbance and any tree and hedge removal. Where required, the internal access tracks would likely be constructed of stone laid on a geotextile membrane, with any required excavation kept to a minimum.

2.10.19. The indicative options for the location of construction accesses are displayed in **Figure 2.9**. The final access locations will be confirmed as the Proposed Development design progresses and in consultation with the County Highways Authorities.

Recreation and amenity improvements

2.10.20. The Proposed Development will include recreation and amenity improvements. These will be designed to retain and enhance recreational connectivity across the Site.

2.10.21. Based on feedback from non-statutory consultation, the Proposed Development is exploring several Rights of Way improvements and permissive paths within the Site, as detailed below:

- Proposed new permissive path linking RAF Digby to Scopwick;
- Proposed new permissive path from Heath Road to link to the existing Public Rights of Way (PRoW) between RAF Digby and Rowston and to enable a circular walking route for the Heath Farm austism care centre;
- Proposed new permissive path along the western edge of the Proposed Development linking New England Lane to Brauncewell;
- Improvements to the Bloxham Wood access on Heath Road; and
- Rights of Way Improvements to the existing route between Scopwick and Blankey.

2.10.22. The Rights of Way improvements and new permissive path proposals are illustrated in **Figure 2.5**.

Green infrastructure

2.10.23. The Proposed Development will include landscaping, habitat management, biodiversity enhancement, which will be defined as the design progresses. This will be designed to retain and enhance

ecological and recreational connectivity and will be defined with inputs from the EIA and consultee responses.

2.10.24. The existing hedgerows, woodland and field margins will be retained as part of the Proposed Development, with the exception of gaps required for new access points, visibility at turnings and for the installation of cabling. Existing agricultural tracks and field margins would be used for access points where possible and, if required, the width of any new gaps will be kept to a minimum.

2.10.25. The design will incorporate a minimum offset of 10m from all existing trees and hedgerows, where practicable, to reduce the environmental impact and to ensure there is a sufficient distance between the infrastructure and the field boundary to allow habitat connectivity and biodiversity and landscape improvements.

2.10.26. Landscaping, including new hedgerow and tree planting is proposed to avoid or minimise significant environmental effects. The location and scale of planting is to be determined and will take into consideration the landscape character of each parcel by allowing views to remain open, where planting will not be appropriate.

2.10.27. The planting type would be resilient to climate change and comprise of majority native (and of local provenance) species that contribute towards biodiversity enhancement.

2.11. Construction phase

Indicative construction programme

2.11.1. Subject to obtaining development consent and following a final investment decision, construction is assumed for the purposes of the assessment to commence no earlier than 2026 and last for up to 48 months, followed by a commissioning period, including site restoration, landscaping and grid connection of approximately 6 months.

2.11.2. It is anticipated that the construction of the Proposed Development will be completed in two phases within the 48 month construction period. The construction phasing is not defined at this stage and will be presented and assessed within the ES.

2.11.3. It is anticipated that the initial works for each phase would include enabling works comprising access works including installation of any internal access tracks that may be required, enabling works, installation of temporary construction compounds and installation of fencing. Following this, the main construction works including construction of the Springwell Substation, Solar PV development, Collector Compounds and BESS would take place.

Construction activities

2.11.4. The ES will provide further details of the proposed construction activities, their assumed duration, along with an assumed programme of each phase of works.

2.11.5. The types of construction activities that would be required comprise (not necessarily in order):

- Site preparation, including minor localised site levelling, vegetation clearance, landscape planting and establishment of perimeter fencing and security measures;
- Import of construction materials, plant and equipment to Site;
- Establishment of Site construction compounds and welfare facilities;
- Appropriate storage and capping of soil;
- Upgrading existing tracks and construction of new access roads within the Site;
- Marking out the location of infrastructure;
- Cable installation;
- Trenching in sections;
- Appropriate construction drainage;
- Sectionalised approach of duct installation;
- Excavation and installation of jointing pits;
- Cable pulling;
- Testing and commissioning; and
- Site reinstatement (i.e. returning any land used during construction, for temporary purposes, back to its previous condition).

2.11.6. The site preparation and enabling works would involve the following activities (not necessarily in order):

- Preparation of the land, including any localised site levelling for the Springwell Substation (where required);
- Construction of the internal access tracks;
- Construction of the construction compounds;
- Marking out the locations for the infrastructure;
- Installation of the perimeter fencing and security features; and
- Delivery of construction materials, equipment and plant to the Site.

2.11.7. The erection of the Solar PV Mounting Structures and the mounting of the Solar PV modules would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Piling (where required) and installation of the Solar PV Mounting Structures (see **Plate 2.10** and **Plate 2.11**); and
- Mounting of the Solar PV modules.

Plate 2.10 Typical Solar PV Module Mounting Structure installation

Plate 2.11 Example of the use of pilling rigs for the preparation and installation of Solar PV Module Mounting Structure

2.11.8. The installation of electric cabling, inverters, transformer, switchgear, Collector Compounds and BESS infrastructure would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Trenching and installation of cabling;
- Transformer, Inverter and Switchgear installation and construction. It is likely cranes would be used to lift the equipment into position;
- Foundation excavation for the BESS and Transfer, Inverter and Switchgear (if required);
- Pouring of the concrete foundation base, where required;
- Installation of transformers that form part of the BESS;

- Construction of control buildings that form part of the Collector Compounds and BESS; and
- Installation of control, monitoring and communication systems.

2.11.9. The construction of Springwell Substation compound and installation of equipment would include the following activities (not necessarily in order):

- Import and delivery of materials to the Site;
- Foundation excavation and construction;
- Pouring of the concrete foundation base; and
- Installation of the Springwell Substation.

Construction plant

2.11.10. It is anticipated that the construction plant utilised for the construction of the temporary compounds and site access tracks would comprise excavators, dump trucks and vibrating rollers.

2.11.11. It is anticipated that the construction plant utilised for the construction of the Solar PV development, Springwell Substation would comprise excavators, piling rigs, concrete mixers, tele-handlers, cranes and mobile elevating work platforms. It is anticipated that the piling rigs used for the installation of the Solar PV modules would be small units which will be installed by driven or helical steel piles. There may be a requirement to use large piling rig units for the construction of the foundations for the Springwell Substation buildings, if required due to the ground conditions.

Construction site compounds

2.11.12. Temporary compounds would be established before commencement of the main construction works for the storage of materials, plant and equipment. The compounds would typically include staff office and welfare facilities, security gatehouse, waste storage, plant and machinery storage, drainage, fencing and CCTV.

2.11.13. The temporary compounds would include hardstanding areas, with haul road areas comprising stone laid on a geotextile membrane. The construction compounds would include manually operated lighting systems to ensure safety and security, especially in the winter months.

2.11.14. It is anticipated that there would be three main construction compounds located across the Site which would be approximately 250m x 100m. It is likely that there would be up to six smaller satellite compounds in other fields across the Site which will

measure approximately 50m x 25m. The indicative location of the construction compounds are detailed in **Figure 2.8.**

2.11.15. For the purposes of the preliminary assessment, it has been assumed that one main construction compound and one satellite construction compound are located within each of the indicative siting zone locations displayed in **Figure 2.8**.

Construction access

2.11.16. The primary point of construction and operational access to the Site is assumed to be directly from or via the A15 Sleaford Road, utilising the existing B1191. It is anticipated that the main construction access to the Site for the construction of the National Grid and Springwell Substation will be via the A15 Sleaford Road.

2.11.17. The construction access strategy is still being developed in coordination with the environmental inputs and engagement with National Highways and the County Highways Authority. Two routes have been considered for construction traffic including HGVs to access the Site from the strategic road network. These include an assumed primary and secondary construction route:

- Primary Construction Route: Primary access to the Site is anticipated to be directly from the A15 and via the B1191 to provide access to the east section of Springwell West, Springwell Central and Springwell East.
- Secondary Construction Route: Secondary access to the Site which is anticipated to be used as a contingency route should there be any roadworks on the B1191 and to avoid any potential temporary conflict with harvesting traffic. It is anticipated that secondary access to the Site will be via one-way routing from the A15 and via the B1202 (Metheringham Heath Lane) and south along the B1188 and outbound via Bloxham Lane and onto the B1202 (Metheringham Heath Lane).

2.11.18. There are several access point and road crossing options to the three parcels across the Site which have been identified in order to access the Site. The final construction accesses will be determined by technical surveys, ongoing engagement with the County Highways Authority and following the development of the arrangement and layout of the Proposed Development. The final access points will be detailed and assessed within the ES.

2.11.19. The indicative options for access points for construction and operation are displayed in **Figure 2.6**.

2.11.20. The requirement and extent for any improvements will be determined following the completion of the visibility and swept path analysis assessment. Initial swept path analysis has been

completed for the preferred field access locations. Improvements to field access has been identified and included in the development of the design. Improvements to the Gorse Hill Lane junction with A15 Sleaford Road will be required to facilitate a safe means of access to/from the substation. Any areas requiring highway accesses or improvements will be detailed and assessed within the ES.

2.11.21. The construction, operation and decommissioning access will be confirmed as the design progresses and in consultation with the County Highways Authorities.

2.11.22. Temporary access tracks would be constructed to link the temporary compounds to the Site access points. Where required, temporary access tracks would be constructed of stone laid on a geotextile membrane.

2.11.23. It is anticipated that onsite access tracks used for construction and operation (including maintenance) would follow the existing agricultural tracks, where possible, to limit the soil disturbance and any tree and hedge removal. Where required, the internal access tracks would likely be constructed of stone laid on a geotextile membrane, with excavation kept to a minimum.

Abnormal load deliveries

2.11.24. It is proposed that any Abnormal Indivisible Loads (AIL) would access the Site via the A15 Sleaford Road and onto Gorse Hill Lane. Initial swept path analysis has been undertaken to determine whether third party land or land under the ownership of National Highways and/or the Local Highways Authority is required in order to support delivery of any AIL movements and whether any street works to the public highway (or adjoining land) are required. This has been completed in two-dimensions only at likely pinch-points at this stage with checks for vertical clearance to bridges and ‘humps in the road’ to be completed as the design of the Proposed Development develops. It is assumed that AILs would be required for the transformers for the Springwell Substation, accessed directly from Gorse Hill Lane. The swept path analysis will be updated following the confirmation of specific plant requirements during the development of the design. Where the AIL would access the site at Gorse Hill Lane, improvements would be required at this junction to make this manoeuvre safe and compliant to design standards. These highway improvement works form part of the Proposed Development and are within the order limits.

2.11.25. An initial swept path analysis has been carried out for field accesses using standard HGV articulated vehicles. Further engagement with the Local Highways Authority will be undertaken

to discuss and agree the approach and any additional requirements that may need to be considered.

Construction traffic and management

2.11.26. In the absence of a detailed phasing strategy and defined origins of materials, it has been assumed for the purposes of this preliminary assessment that c.40 HGV arrivals and c.40 HGV departures could occur on any road link considered for construction traffic. Realistically, this would be spread across a small number of compounds at any specific period of construction and may be dispersed across the road network. This is a reasonable worst case scenario which has been assessed in accordance with the methodology.

2.11.27. In the absence of a detailed phasing strategy and defined origins of materials, it has been assumed for the purposes of the preliminary assessment that 40 HGV arrivals and 40 HGV departures could occur on any road link considered for construction traffic for the duration of the entire programme of 48 months to ensure a reasonable worst case.

2.11.28. The ES will provide a detailed breakdown of the final assumptions on the type and number of construction vehicles during the construction phase.

2.11.29. Measures to control the delivery of materials and staff onto the Site during the construction phase will be documented within and secured by the Outline Construction Traffic Management Plan. This will include the following details:

- Access and parking arrangements for site personnel, contractors and visitor arrangements for delivery and removal of materials;
- Arrangements for loading, unloading and storage of plant and materials;
- A scheme for routing and control of traffic associated with the construction and temporary signage during the construction phase;
- Implementation programme including the proposed construction period and hours of operation; and
- Details of any additional management measures, including details of wheel washing facilities and condition surveys.

Construction working hours

2.11.30. It is anticipated that the working hours on site would be from 7am until 7pm Monday to Friday and typically 7am – 12 noon on Saturday. No working on Sunday or Bank Holidays.

Construction staff

2.11.31. It is assumed that approximately 10 staff per compound would be on site for the initial site set-up including the forming of the access points and preparation of the ground, which would shortly increase once the compounds are set-up and construction of the access tracks within each parcel begins. It is anticipated that this would increase to a maximum of 600 workers during the peak construction period.

2.11.32. For the purposes of the preliminary assessment, it has been assumed, that at any given compound and time, it is anticipated that 400 workers would be required. The preliminary assessment has assumed a conservative estimate of 1.5 workers per vehicle, acknowledging that the majority of workers will travel as a team on a daily basis.

2.11.33. An Outline Travel Plan will be prepared as part of the Outline Construction Traffic Management Plan. The Outline Travel Plan will set out strategies to encourage the use of sustainable transport for the construction workforce. This will include details on initiatives to increase car sharing, while other measures will be explored for the preparation of the ES such as shuttle services to/from temporary compounds and provision of staff parking facilities, as well as other measures to encourage mode shift away from private car use.

Public rights of way

2.11.34. All PRoW would be kept open during construction as far as is practicable and safe. Where it would not be practicable and safe, there may be a requirement for some existing PRoW to be temporarily diverted or stopped for a duration of approximately 3 months. However, as the detailed construction phasing and development of the design (particularly the location of internal access tracks) is ongoing, a maximum period of 24 months is assumed for the purposes of this preliminary assessment. This maximum period is expected to reduce for the ES stage.

2.11.35. The temporary closure of PRoW will be avoided and diversions will be provided, where possible. If a diversion is required, this would be designed to provide a safe alternative route which would be discussed and agreed with the County PRoW Officer.

2.11.36. The DCO application will be supported by a plan identifying any new or altered means of access, stopping up of streets or roads or any diversions, extinguishments or creation of rights of way or public rights of navigation. A Public Rights of Way Management Plan setting out the public rights of way commitments will also be submitted in support of the DCO application.

2.11.37. The Public Rights of Way Management Plan will include a schedule of public rights of way within the Site and outline the proposed measures to manage any requirements to temporarily close PRoW within the Site during construction.

Construction water consumption

2.11.38. It is anticipated that potable water (drinking water) for the purposes of the construction welfare facilities would be delivered to Site by bowser, where required, or provided by a mains water supply. Where required, raw water for the construction phase is expected to be brought to Site by bowser or may be provided from an existing private irrigation network or using mains water supplies, however, this is to be determined and agreed with the relevant consultees. The reasonable worst case has been assumed for the purposes of the preliminary assessment.

Construction waste

2.11.39. The Proposed Development is likely to generate waste during the construction phase including general construction waste, comprising packaging waste from materials delivered to Site, construction materials from enabling works and general waste from the construction worker welfare facilities.

2.11.40. Measures to manage construction waste will be documented within and secured by the Outline Site Waste Management Plan and the Outline Construction Environmental Management Plan. The Outline Site Waste Management Plan and Outline Construction Environmental Management Plan would likely be managed by the construction contractor to manage the waste arisings and implement the waste hierarchy to ensure as much construction waste is avoided, reused and recycled to reduce the amount of waste that will require disposal.

2.11.41. It is assumed that there would be approximately 5-10 waste skips per week on average for the duration of the 48 month construction period.

2.11.42. All waste to be removed from the Site would be undertaken by fully licenced waste carriers and licenced waste facilities.

Soil management

2.11.43. It is anticipated that during construction any topsoil that is stripped for the purposes of access tracks, the cable trenching works or construction compounds would be stored temporarily within areas adjacent to the cable route or within the temporary construction compounds. The soil would be used to backfill the cable trenches and reinstate any temporary construction compounds and temporary access tracks used for the construction phase.

2.11.44. Measures for soil management, following the principles of best practice to maintain the physical properties of the soil, will be documented within and secured by the Outline Soil Management Plan, 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.

Construction Environmental Management

2.11.45. Key measures to be employed during construction to control and minimise the impacts on the environment will be documented within and secured by the Outline Construction Environmental Management Plan.

2.11.46. The purpose of the Outline Construction Environmental Management Plan is:

- To ensure impact and nuisance levels as a result of construction and operation activities are kept to a minimum.
- To comply with relevant regulatory requirements and environmental commitments.
- To ensure procedures are put into place to minimise environmental effects during construction.

Construction reinstatement and habitat creation

2.11.47. A programme of reinstatement and habitat creation would commence following the construction phase programme. This would include landscaping, habitat management and biodiversity enhancement. This will be designed to retain and enhance ecological and recreational connectivity and will be defined with inputs from the EIA and consultee responses. All such measures will be documented within and secured by An Outline Landscape and Ecological Management Plan.

Commissioning

2.11.48. Following construction and during the 6 month commissioning period, the Proposed Development would be required to undergo a stage of testing before the electricity can be generated and supplied to the National Grid network. The commissioning work is likely to involve a period of inspections and electrical and equipment testing before the Proposed Development can become operational.

2.12. Operational phase (including maintenance)

2.12.1. Maintenance works are expected to occur throughout the operating life of the Proposed Development as and when appropriate. It is assumed that routine inspections would be carried out and access

will be via the previously built construction roads. Maintenance activities are likely to include:

- Regular visual inspection of all infrastructure;
- Regular scheduled inspections and testing of equipment;
- Repair, adjustment, alteration, refurbishment or replacement of consumable items (e.g. inverter filters) and reconstruct the same. The aim being to improve the items operational capability;
- Cleaning of solar PV modules, if required;
- Repair, adjustment, alteration, refurbishment or replacement of panels or other components. The aim being to improve the infrastructure's operational capability or repair any defaults;
- Removal of infrastructure where replaced;
- Delivery of spare parts, replacement equipment items and consumables;
- Water management (e.g. clearing of drainage ditches); and
- Vegetation management (e.g. cut back of grass, hedges, trees).

Operational staff and transport

2.12.2. It is anticipated that there would typically be up to approximately 24 permanent operating staff and security based at the Springwell Substation and BESS facility, with the potential for additional staff attending the facility during repowering activities or Site visits.

2.12.3. It is assumed that external contractors would visit the Site to undertake regular vegetation management and PV cleaning. The ES will set out the estimated number of operational staff, vehicle types and numbers.

2.12.4. In the event that there may be a requirement to replace any equipment, there may be a small number of HGV movements, however, this is anticipated to be low in frequency and on an ad hoc basis.

Operational Environmental Management

2.12.5. The principles and key measures that will be employed during the operation of the Proposed Development to control and minimise the impacts on the environment will be documented within and secured by the Outline Operational Environmental Management Plan, including best practice guidelines on waste and water management.

2.12.6. Any equipment that is damaged or requires replacement during the operational phase will be disposed of following the waste hierarchy, with materials being reused of recycled, wherever possible. Any electrical waste will be disposed of in accordance with the Waste from Electrical and Electronic Equipment (WEEE) Regulations[24].

Landscape and ecological establishment

2.12.7. A programme of landscape and ecology establishment would be carried out. The principles for how the land will be managed throughout the operational phase, following the completion of construction, will be documented within and secured by the Outline Landscape and Ecological Management Plan.

Public Rights of Way

2.12.8. Existing PRoW and proposed permissive paths within the Site will be retained during the operation of the Proposed Development.

Operational water consumption and drainage

2.12.9. It is anticipated that potable water (drinking water) for the purposes of the operational facilities would be delivered to Site by bowser, where required or provided by a mains water supply. Where required, raw water for the operational phase is expected to be brought to Site by bowser or may be provided from an existing private irrigation network or using mains water supplies, however, this is to be determined and agreed with the relevant consultees. The reasonable worst case has been assumed for the purposes of the preliminary assessment.

2.12.10. Effluent from the operational substation facilities is anticipated to be routed to septic tanks which will in turn feed into a filtration system which could be discharged to watercourses. This is to be determined following the detailed Surface Water Drainage Strategy and agreed with the relevant consultees.

Battery safety

2.12.11. A management plan for battery safety will be prepared and submitted with the DCO application in a document entitled Battery Safety Commitments. The Battery Safety Commitments will detail the regulatory guidance reviewed to ensure that all safety concerns around the BESS element of the Proposed Development are addressed in so far as is reasonably practicable.

[24] Waste Electrical and Electronic Equipment (WEEE) Regulations (2018). Available online: Regulations: Waste Electrical and Electronic Equipment (WEEE) - GOV.UK (www.gov.uk)

2.13. Decommissioning phase

Ground Mounted Solar PV Generating Station, Springwell Substation and BESS

2.13.1. The Proposed Development is assumed to be operational for a period of 40 years (this depends on the operational capability of the Proposed Development as a result of its maintenance regime as with any generating asset). Following the operational period, the Proposed Development would require decommissioning. This would involve the removal of all of the Solar PV infrastructure, including the Ground Mounted Solar PV Generating Stations, Collector Compounds, Springwell Substation, BESS and ancillary infrastructure including any on site compounds.

2.13.2. At the end of the operational phase, any above ground infrastructure will be dismantled and removed in accordance with industry best practice at the time. The decommissioned materials will follow the waste hierarchy such that they would be reused where possible before recycling and disposal were considered.

2.13.3. Solar PV modules are made up of several materials including a metal frame of which approximately 99% can currently be recycled. At the time of decommissioning, options to re-use or recycle materials will be explored to ensure as much of the materials as possible are recycled and diverted from landfill.

2.13.4. It is assumed that 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.

2.13.5. It is anticipated that after the operational period of 40 years, that the land within the Site will be returned to agricultural use and established habitats and planting, such as hedgerows and woodland would be retained.

2.13.6. The retention of permissive paths will be subject to the landowners' discretion post-decommissioning, therefore due to this uncertainty, the retention (or otherwise) of these permissive paths post-decommissioning has not been considered within this PEIR and will be addressed within the ES.

2.13.7. It is likely that structural long term planting proposed as part of the Proposed Development will be retained post – decommissioning to ensure the development of long term legacy habitats, however, this will be subject to the landowners' discretion.

2.13.8. At the time that decommissioning would take place, the regulatory framework, good industry practices and the future baseline could have altered. The Applicant will consider and implement a Decommissioning Environmental Management Plan, taking account of good industry practice, its obligations to landowners

under the relevant agreements, all relevant statutory requirements and management of traffic, waste, and biodiversity. An Outline Decommissioning Environmental Management Plan will be submitted in support of the DCO application, which will be secured by a DCO requirement.

2.13.9. Decommissioning is expected to take approximately 24 months and may be undertaken in phases of work. Decommissioning works would generally mirror the construction phase in reverse.

3. Reasonable Alternatives Considered

3.1. Introduction

3.1.1. This chapter provides a summary of the reasonable alternative options that have been considered by the Applicant for the Proposed Development to date, including the initial selection of the Site and through the development of the design.

3.1.2. This chapter also details how the assessment of sites and design alternatives has been undertaken and details the factors that have been considered and the main reasons for discounting alternative design options.

3.1.3. The following alternatives have been considered during the design evolution process to date:

- Alternative sites;
- Alternative renewable technologies;
- Alternative solar technologies; and
- Alternative layouts including for the solar PV development, Battery Energy Storage System (BESS), Springwell Substation and associated cable routes.

3.2. Need for the Proposed Development

3.2.1. The compelling need for global action to decarbonise, continues to be reinforced. On 20th March 2023, the U.N. Intergovernmental Panel on Climate Change (IPCC) published its 2023 assessment of global climate change. The report concludes that the world is likely to pass a dangerous temperature threshold within the next 10 years, pushing the planet past the point of catastrophic warming — unless nations drastically transform their economies and immediately transition away from fossil fuels[25].

3.2.2. In May 2023, the World Meteorological Organisation stated that the likelihood of one of 2023 – 2027, and the five-year period, being the hottest on record was 98%.

3.2.3. There is a growing body of UK energy and climate change international commitments, law, policy and guidance which highlights an urgent need for new energy generation infrastructure, particularly from renewable sources such as solar. Alongside this drive for new energy generation, the UK Government has committed to achieving net zero greenhouse gas emissions by 2050 and decarbonisation of the energy sector by 2035.

[25] Intergovernmental Panel on Climate Change (2023). Climate Change Report. Available here: AR6 Synthesis Report: Climate Change 2023 — IPCC

3.2.4. Decarbonisation is a UK legal requirement and is of global significance. In June 2019, the Government passed law to end the UK's contribution to global warming by 2050: Net Zero.

3.2.5. UK electricity demand is expected to double by 2050. Decarbonisation requires the electrification of energy which is currently sourced from fossil fuels (including gas, petrol and diesel). The UK's pathway to achieving Net Zero by 2050 must also involve wider transitions outside of the power sector, including decarbonising transport, industry, agriculture and homes.

3.2.6. In June 2023, the Committee on Climate Change (CCC) published their Progress Report to Government[26]. The report stated that *"To achieve the NDC (Nationally Determined Contribution) commitment of at least a 68% fall in territorial emissions from 1990 levels, the rate of emissions reduction outside the power sector must almost quadruple."*

3.2.7. Extensive electrification requires the major expansion of renewable and other low-carbon power generation to ensure that the UK is capable of securely meeting future electricity demand, and with a significantly lower carbon intensity. The decarbonisation of UK electricity generation is therefore vitally important to meet the UK's legal obligations on carbon emissions and ensure sustainable energy resilience. Yet the CCC also stated in their June 2023 Progress Report that *"Some of the key planks of the UK Net Zero Strategy have substantial lead-times,"* implying that these "planks" may not make significant (if any) contributions to achieving the 2030 Nationally Determined Contribution.

3.2.8. The decommissioning of existing generation assets also increases the requirement to develop new low-carbon generation with urgency in order to "keep the lights on".

3.2.9. Nuclear power has historically met circa 20% of UK electricity demand, but existing nuclear stations began to close in 2021. Only one existing plant (1.2GW) is scheduled to remain operational beyond 2028. One new nuclear project (Hinkley Point C, funded and currently under construction) is scheduled to be commissioned in the late 2020s. At the time of writing, the only other new nuclear power station with development consent is Sizewell C. Sizewell C started a private investment process in September 2023 and is proposed to be a replica of Hinkley Point C. Great British Nuclear announced six winners of a Small Modular Reactor (SMR) competition in October 2023, the winners being those technologies which Great British Nuclear viewed as most likely to meet the objective of a final investment decision in 2029. National Grid ESO's Future Energy Scenarios report (2023) includes a commissioning

[26] Committee on Climate Change (2023). Progress Report to Parliament. Available here: 2023 Progress Report to Parliament - Climate Change Committee (theccc.org.uk)/

assumption for the first Sizewell C unit and the first SMR in the UK in 2034.

3.2.10. Only one UK coal station is still in operation and is currently scheduled to close in September 2024. Carbon Capture Utilisation and Storage (CCUS) is a key plank under development to support Net Zero by facilitating the decarbonisation of the UK's thermal (carbon emitting) fleet, currently circa 40GW, decarbonising industry, producing low-emissions hydrogen and delivering greenhouse gas removal technologies. Recent progress has been made towards bringing CCUS clusters forward by the end of the decade however Government recognises that the technology has not been delivered at scale and significant risks remain.

3.2.11. Hydrogen is another key plank, but its development is not yet guaranteed. Technological hurdles must be overcome, grid connection, funding and consents must be secured. Blue hydrogen relies on functional CCUS operating at GW-scale; pink hydrogen on abundant electricity from new nuclear facilities; and green hydrogen on abundant low-carbon electricity. Not all enablers to hydrogen production are yet guaranteed, and while the future path to a low-carbon future is incredibly uncertain, much progress has already been made in the delivery of renewable generation facilities.

3.2.12. The UK has substantial renewable energy resources, and the Government is targeting 50GW of offshore wind to be operational by 2030 to harness that resource and shield consumers from volatile international energy markets. But wind on its own is not sufficient and the Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[27] states at Paragraph 3.3.20 that *"a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar".*

3.2.13. The development of large-scale solar in the UK (National Grid estimates up to 39.1GW by 2030 rising to 92GW by 2050) will provide an essential diversity to the UK's low-carbon generation portfolio, working with other technologies to deliver security of supply and value to UK consumers. The British Energy Security Strategy (April 2022)[28] set an ambition of 70GW of solar by 2035 (an increase of 56GW from the current provision).

3.2.14. Mission Zero[29], published in January 2023 by Rt Hon Chris Skidmore MP, Chair of government's Independent Review of Net Zero, finds that *"The benefits of net zero will outweigh the costs"* and believes that *"This is too important to get wrong"*. Mission Zero

[27] 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
[28] https://www.gov.uk/government/publications/british-energy-security-strategy
[29] Department for Energy Security and Net Zero (2023). Mission Zero: Independent Review of Net Zero. Available here: Review of Net Zero - GOV.UK (www.gov.uk)

recommends the *"Full-scale deployment of solar…to harness one of the cheapest forms of energy, increase our energy independence and deliver up to 70GW of British solar generation by 2035"*.

3.2.15. Government's Powering Up Britain strategy (updated April 2023)[30] concludes that an acceleration of the deployment of renewables is critical to the delivery of the Government's plans: *"Our goal is to develop up to 50GW of offshore wind by 2030 and to quintuple our solar power by 2035"* [p7], noting that 14GW of solar was already installed in the UK at the time of writing the report.

3.2.16. Solar generation is therefore a critical element of the plan to decarbonise the UK electricity sector with urgency and is already a leading low-cost generation technology in the UK. The national need for solar generation is urgent and the capacity required is significantly greater than the capacity of projects currently understood to be in development.

3.2.17. Solar addresses all important aspects of existing and emerging government policy. It will make a critical and timely contribution to decarbonisation and security of supply in the UK, will help shield consumer bills from volatile energy prices and international supply markets, and provides the potential to deliver biodiversity net gains through its development.

3.2.18. It is therefore important that the assessment of alternatives is considered in the context of the urgent national need.

3.3. Alternatives considered

Policy Background

3.3.1. NPS EN-1 paragraph 4.4.1 confirms that from a policy perspective, there is no general requirement to consider alternatives or to establish whether a development represents the best option. This is reinforced by paragraph 4.2.11 of the Draft NPS EN-1 (March 2023).

3.3.2. The Applicant's focus was on the land suitable for solar and available for development, which is in accordance with NPS EN-1 paragraph 4.4.1, and reinforced by paragraph 4.2.11 of the Draft NPS EN-1. The Applicant's view is that this is a good site for solar which is suitable in planning and environmental terms.

3.3.3. Regulation 18(2)(d) of the EIA Regulations[31] requires *"a description of the reasonable alternatives studied by the developer, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option*

[30] Department for Energy Security and Net Zero (2023). Powering up Britain. Available here: Powering up Britain - GOV.UK (www.gov.uk)
[31] The Planning (Environmental Impact Assessment) Regulations (2017). Available here: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)

chosen, taking into account the effects of the development on the environment" to be presented in the ES. A description of the alternatives considered to date is therefore presented in this PEIR and a full description of the alternatives will be provided in the ES.

3.3.4. A 'no development' alternative would not deliver the additional electricity generation capacity associated with the Proposed Development and would not satisfy the policy need and will therefore not be considered further.

3.3.5. Taking this overall context, the Applicant's site selection process is outlined below.

Alternative sites

3.3.6. Before setting out the Applicant's site selection process, it is important to note that the Applicant started by seeking to identify a suitable site which met their central objective to deliver an NSIP-scale project across a large site, equivalent to around 250-500MW using the rule of thumb in paragraph 3.10.8 of Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[32].

3.3.7. The Applicant did not consider sites which could deliver smaller scale projects on the basis of the urgent need to deliver as much solar as possible to meet ambitious Government targets (see section on Need above) and the viability of delivering the Proposed Development given the significant upfront investment to facilitate the new grid connection. Indeed, given the limited availability of connections into the National Electricity Transmission System (NETS) (which utility scale solar is required to do), it is important that any connection is used as efficiently as possible. The reasons why existing connections could not be utilised are also set out below.

3.3.8. This approach is supported at the NPS level: paragraph 4.2.21 of Draft NPS EN-1 states that only alternatives that can meet the same objectives of the proposed development need to be considered. Paragraph 4.2.2 states that the Secretary of State should be guided in considering alternative proposals by whether there is a realistic prospect of the alternative delivery of the same infrastructure capacity in the same timescale as the proposed development. Smaller scale alternatives which would not meet the objective of meeting the same urgent need as the Proposed Development would not be considered reasonable alternatives for the purposes of paragraphs 4.2.21 and 4.2.22 of Draft NPS EN-1.

[32] Draft National Policy Statement for Renewable Energy (EN-5) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements

3.3.9. It is critical to understand that site selection is a complex process with many variables and conditions that have to be sufficiently favourable across key areas to proceed. Some matters are more definitive in terms of the ability to proceed while others are matters balanced and weighed against alternative options.

Suitability for solar and consistency with project objectives

3.3.10. The Applicant aims to develop a nationally significant solar generation facility on a large site in order to contribute to meeting the UK's urgent and national need for low-carbon electricity. The Applicant therefore considered general factors associated with irradiance and site topography and found that the East Midlands is characterised by large swathes of flat or undulating land (which is highly suitable for solar generation) and relatively high levels of irradiation.

3.3.11. The East Midlands is also crossed, from north to south, by a number of high voltage transmission lines. These lines are important arteries of the NETS, located between the demand centres of the south and the northern generation zones. They provide resilience through strength in depth to the NETS to enable very high levels of reliability to all users and are therefore likely to be well suited to connect large-scale solar generation facilities and allow the bulk transmission of power to consumers nationally whenever that power is demanded.

3.3.12. Having prioritised a broad geography, the next driver for the site location, consistent with paragraphs 3.10.36-38 of Draft NPS EN-3, was the availability of a suitable grid connection with sufficient capacity to enable a large solar farm, to maximise the lifetime output potential of the Proposed Development through a 400kV line connection and the development of a new substation.

3.3.13. The Applicant started engagement with National Grid Electricity System Operator (NGESO) (as the point contact for new connection requests) to discuss the potential opportunities for a connection offer within the target geography. In November 2020, the Applicant prioritised the two 400kV overhead lines West Burton to Bicker Fen line and Cottam to Eaton Socon line. This is because both were found to have available capacity following discussions with NGESO, due to the decommissioning of the coal plants at Cottam and West Burton and are part of the "backbone" of the UK transmission network.

3.3.14. Grid connections with spare capacity are finite, and no connection offers were provided that could deliver the output proposed by NGESO to the Applicant for already available capacity at already existing substations in the target geography. This is somewhat inevitable given the context of the urgent national need for renewable energy (specifically solar), as developments have

already been proposed to make use of existing substation capacity where it occurs. However, the capacity of projects currently under development is not yet sufficient to meet the urgent national need for solar as explained above.

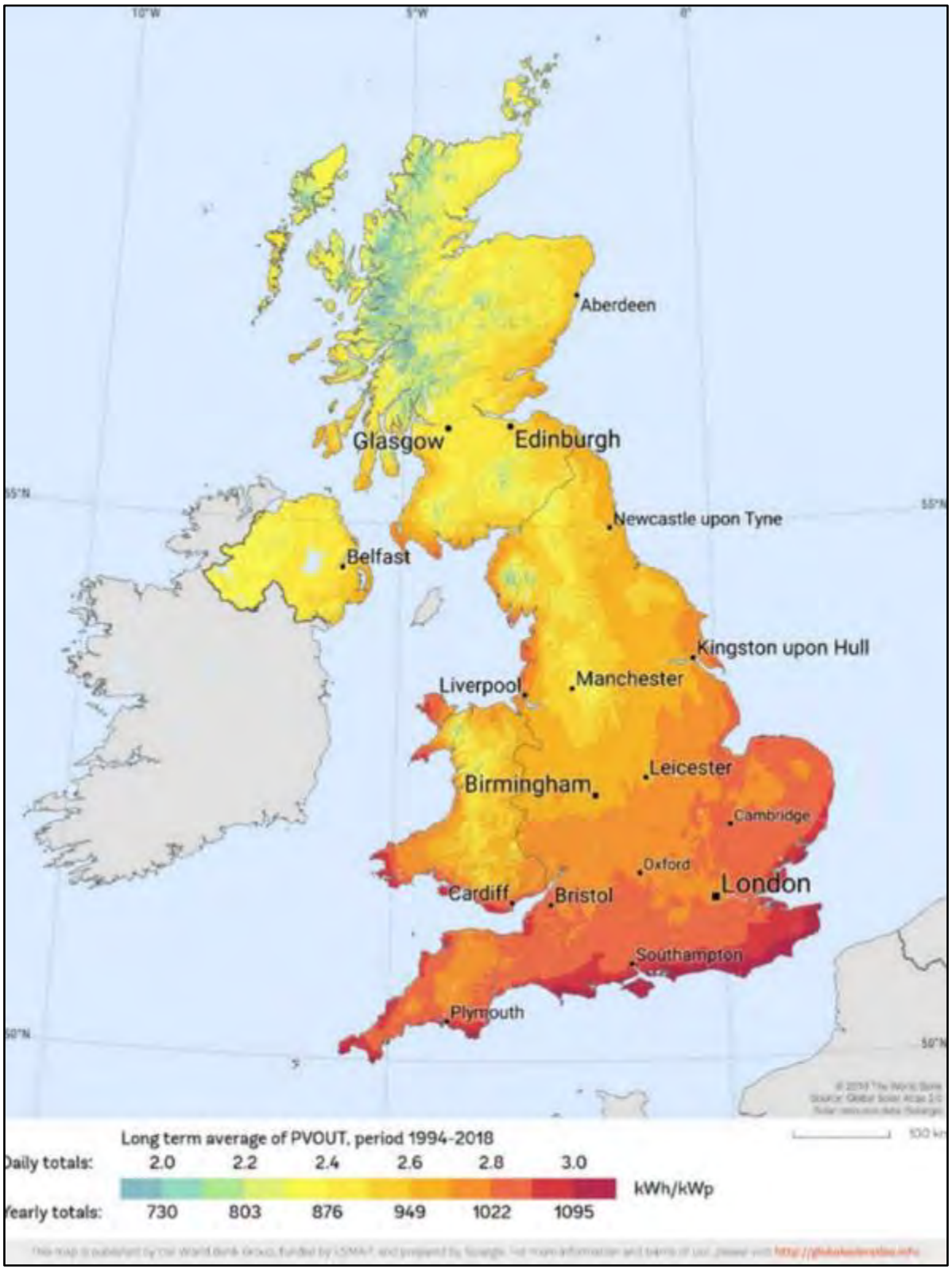
3.3.15. Against this background, the Applicant considered several important factors, as set out in the following section, before arriving at the preferred Site. As site selection considerations for solar are not set out in the current adopted suite of NPS, these are outlined below drawing on the factors influencing site selection as set out in the Draft NPS EN-3.

Irradiance and site topography

3.3.16. The Draft NPS EN-3 notes that site topography is a key input to the site selection process under paragraph 3.10.10 Irradiance and Site Topography, which states, *"Irradiance of a site will, in turn, be affected by surrounding topography, with an uncovered or exposed site of good elevation and favourable south-facing aspect more likely to increase year-round irradiance levels. This, in turn, affects the carbon emission savings and the site's commercial viability."*

3.3.17. Lincolnshire represents a good location within the UK to construct a solar farm as demonstrated below (bearing in mind the constraints in other locations). The area benefits from higher levels of photovoltaic power and irradiance compared to other parts of the UK, as show in **Plate 3.1**.

Plate 3.1 Average photovoltaic power



3.3.18. Flat or gently south-facing slopes are most suitable and beneficial for solar. Therefore, this influenced the focus on the East Midlands area as the preferred location of the Site. The general topography

of the area surrounding the Site is flat or with limited gradients, making it particularly suitable for solar. Fields with entirely north-facing slopes were excluded from the area considered suitable for solar panels.

3.3.19. Topography, which is generally flat or gently undulating, is most suitable for solar from both a constructability and operational perspective to ensure that the Site can produce a large amount of electricity.

3.3.20. In addition, Lincolnshire benefits from the existence of large areas of land which are characterised by a generally sparce settlement pattern. Such characteristics provide the opportunity for utility scale solar development which can contribute to delivering net zero.

Grid connection and capacity

3.3.21. As explained above, having identified that the wider geography was generally suitable for solar and that there was overall capacity on the two 400kV lines (West Burton to Bicker Fen line and Cottam to Eaton Socon line), the Applicant commenced discussions with NGESO about how best to connect into that capacity.

3.3.22. Early discussions with NGESO identified that a new substation would be required to connect into the available capacity in the overhead lines as the existing substations on the line are either full or located in unsuitable places for solar.

3.3.23. The Applicant therefore focused on identifying a site that was suitable for solar along one of the overhead lines, before starting discussions with landowners on what land would be potentially available for development. In undertaking this search, areas of land closer to the 400kV lines were preferred, to minimise the length of cable connection, which adds both to cost, time and complexity, in terms of negotiation with multiple additional landowners and any environmental constraints associated with the cable route, in addition to potential delay in the overall consenting and delivery timescale. A shorter cable route also reduces loss of energy in transporting power to the grid and presents a more efficient use of land particularly where routing can be delivered in proximity to the infrastructure to generate the power rather than crossing other land unrelated to a development.

3.3.24. This stage of the process is developer, not NGESO, driven and once the Applicant was able to identify suitable land with a reasonable prospect of it being brought forward, locational conversations with NGESO were undertaken with a connection request subsequently being made.

3.3.25. NGET is working in parallel with Springwell to identify the most appropriate location for their new substation, into which Springwell will connect. The Springwell DCO application will seek consent for

a connection into the future National Grid Navenby Substation. However, it is not proposed that the National Grid Navenby Substation itself will form part of the Springwell DCO application and consent is expected to be sought by NGET in due course through a Town and Country Planning Act 1990 application.

Land ownership

3.3.26. Following identifying capacity and a broad area of search as close as possible to the 400kV lines, the Applicant started initial discussions with landowners.

3.3.27. Blankney Estate is one of the largest single landowners within Lincolnshire and was willing to discuss the potential option for large solar development within their Estate. The willingness of the Estate to enter into discussions regarding the development of utility scale solar was key to the progression of the Site through the selection process and enabled the Applicant to have more detailed conversations with National Grid about appropriate connection points. Another renewable energy developer had already obtained planning consent for a smaller scale solar farm in the eastern part of the Site through a Town and Country Planning Act 1990 application, which was approved in September 2014 (reference 14/0397/FUL).

3.3.28. The initial discussions with Blankney Estate focussed on identifying a site with sufficient additional land for the Proposed Development, as well as mitigation and enhancement, as close as possible to the West Burton to Bicker Fen 400kV line. The Applicant initially sought to actively identify a single site of a particular size, led by landowner discussions to identify potentially available land suitable for a large solar development and whether any potential effects could be made acceptable. The ability to reach a voluntary agreement with landowners rather than rely on Compulsory Acquisition for the solar PV generating station was a key requirement, and therefore single, contiguous sites with as few landowners as possible were prioritised. The Site has two individual landowners who were agreeable in principle to leasing their land for solar. Other areas for the solar PV development around and further from the connection point were discounted due to reasons such as multiple land ownerships or unwilling landowners.

Proximity of the Site to dwellings

3.3.29. The Blankney Estate is a large estate with discrete settlements dispersed throughout the Estate; there are also groups of dwellings scattered within the surrounding area. The existence of large areas of land without built development and a generally sparse settlement pattern means that there is the opportunity to identify sites of sufficient scale to deliver an NSIP scale project.

3.3.30. Although the Site is located in relatively close proximity to the village of Scopwick and the smaller hamlet of RAF Digby, Ashby de la Launde, and Blankney, there are opportunities to provide mitigation and help assimilate the Proposed Development into the landscape and limit any potential visual impacts through a combination of setbacks, natural screening through topography and existing and proposed landscape improvements.

3.3.31. There are a small number of dwellings that could experience significant effects from the Proposed Development. This number has been reduced by the changes proposed after Phase One Consultation: *Early plans and proposals*, January 2023 consultation feedback and additional engagement with near neighbours. The design of the Proposed Development will continue to evolve as a result of feedback received during statutory consultation and ongoing assessment work. This evolution will continue to seek to minimise any potential impacts that the Proposed Development may have.

Environmental considerations

3.3.32. The Applicant had regard to several important environmental considerations when determining the most appropriate location for the Site. Key considerations are described below.

3.3.33. The area around the West Burton to Bicker Fen 400kV line is not subject to any protected landscape or spatial designations such as Areas of Outstanding Natural Beauty, National Parks or Green Belt. Whilst it is a countryside location, Draft NPS EN-3 recognises that schemes of this type and scale will often be located in rural locations given their physical requirements, provided that the planning and environmental effects are acceptable.

3.3.34. The area around the West Burton to Bicker Fen 400kV line is not subject to any ecological designations such as Site of Special Scientific Interest (SSSI), Ramsar, Special Protection Area (SPA) or Special Area of Conservation (SAC). The Site is not subject to cultural heritage designations such as Scheduled Monuments. However, cultural heritage assets, including listed buildings, in the vicinity were identified as requiring further consideration. Environmental features are shown in **Figure 3.1**.

Agricultural land

3.3.35. Whilst Draft NPS EN-3 indicates that Agricultural Land Classification (ALC) should not be a *"predominating factor in determining the suitability of the site location"* (paragraph 3.10.14), ALC was an important factor for the Applicant when selecting the Site. The wider context of potential use of agricultural land is important in this regard. 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%. In the context of the location of the Proposed Development and the surrounding land type characteristics, the provisional Defra mapping, as displayed in **Plate 3.2**, shows Grade 2 land is in general abundance in areas adjacent to the Site, notably a large swathe to the east within the River Witham's flood plain and either side of the A15, north of Metheringham and narrower stretch running south from adjacent Scopwick to Ruskington. Further south-east towards Boston and the east coast, the Defra mapping shows a predominance of Grade 1 land. It is notable that much of the West Burton to Bicker Fen 400kV, particularly, east of Springwell falls on predominantly higher grade land, with a mixture of Grade 2 and Grade 3 as the line moves north-west past Navenby.

3.3.36. The Site was considered favourable because it 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. While the Draft NPS EN-3 does not prohibit the use of BMV and recognises that utility scale solar is likely to include some agricultural land, the preference is that poorer quality land is prioritised. The Applicant has sought to identify available land of lower grade adjacent the West Burton to Bicker Fen 400kV line; however, as the provisional mapping demonstrates, there is an abundance of both Grade 3 and Grade 2 land in relative proximity to the Proposed Development and that in order to deliver the proposed capacity, not only is it likely that a significant percentage of BMV land would likely be required, but that the Site represents a better than characteristic snapshot of the predominating land mix, and certainly significantly less BMV than the county wide mix of ALC grades. ALC also needs to be balanced with the other site identification criteria, including the grid capacity. Draft NPS EN-3 states at paragraph 3.3.35, applicants should avoid the use of BMV "where possible", and that is what the Applicant has achieved in its site selection process.

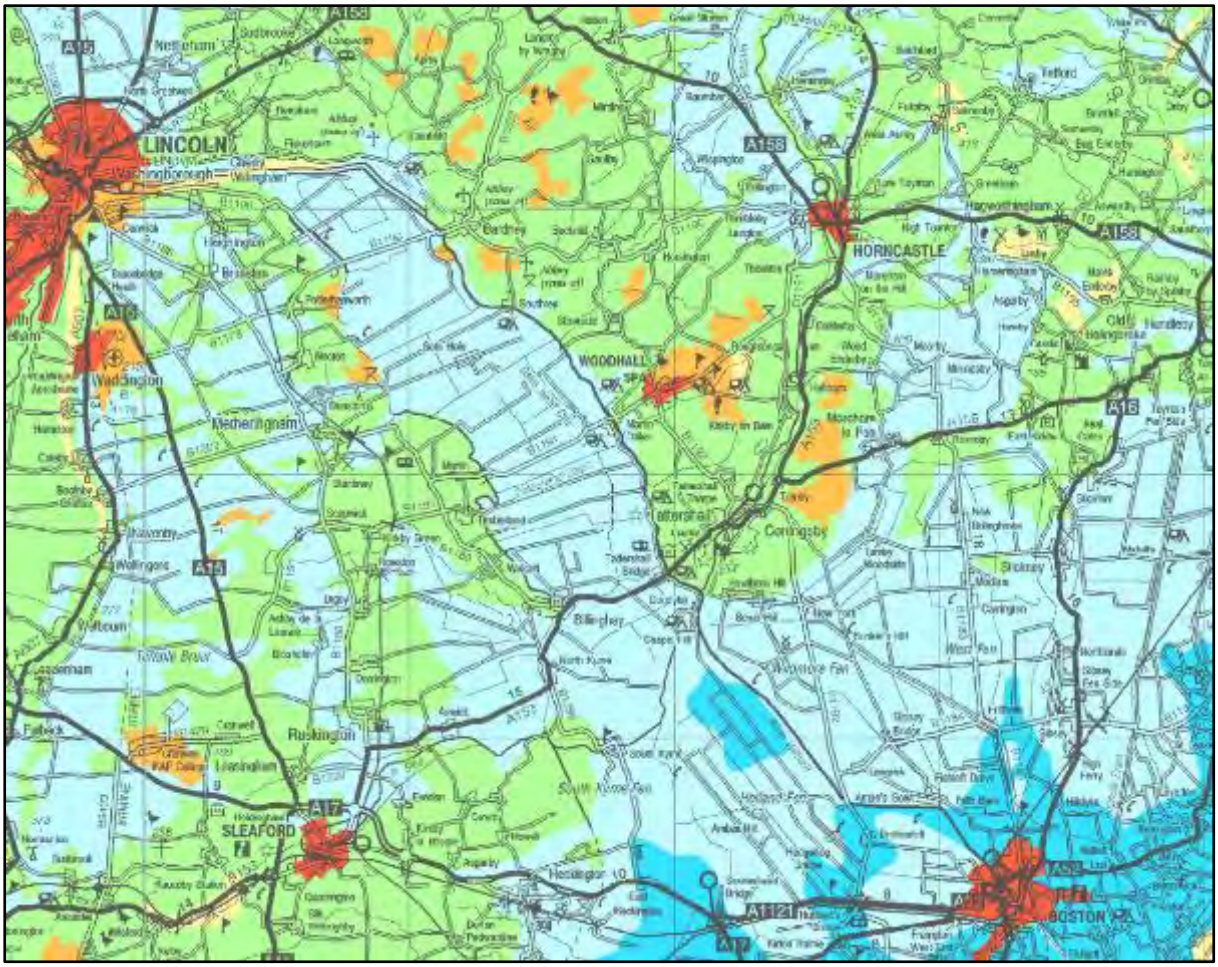
3.3.37. In addition, the Applicant sought to work with the landowners to understand relative productivity of the land alongside the provisional mapping to focus on areas of available land with poorer yield, noting that the provisional mapping and classification does not always go hand in hand with the reality of cultivating the land. As the Applicant's understanding of the Site has developed in terms of the land classification, the design development has built on the earlier desire to limit the use of the provisional higher grade land, and strong principles which focus on limiting the amount of BMV used

within the solar PV areas have been implemented. For example, where Grade 1 and 2 land was identified and, as noted below, where this was in single fields, this was removed from the fields proposed for Solar PV development. Further information on ALC is provided in **Chapter 10** of this PEIR.

3.3.38. The land adjacent the Cottam to Eaton Socon line also presents a mixture of Grade 2 and Grade 3 land types although the provisional mapping suggests a predominance of Grade 3 in immediate adjacency to the line. However, there was not sufficient land available to the Applicant to deliver similar capacity as with the Site.

3.3.39. It is important to recognise that ALC grading does not exist in isolation and is one of many important factors in site selection and consideration of alternatives and that the urgent national need for low carbon and renewable energy generation is considered to outweigh the temporary loss of BMV land for the duration of the Proposed Development's lifetime.

Plate 3.2 Provisional Land Classification Map



Accessibility

3.3.40. The Site is accessible by the rural road network and the strategic road network by the A15, a major dual carriageway which runs through the Springwell West Parcel. This is an important factor when considering possible effects during construction and the ability of the road network to accommodate HGVs and potential Abnormal Indivisible Loads (AILs). Further information on transport and access is provided in **Chapter 12** of this PEIR.

Brownfield sites

3.3.41. NPS EN-3 states: *"As most renewable energy resources can only be developed where the resource exists and where economically feasible, the IPC should not use a sequential approach in the consideration of renewable energy projects (for example, by giving priority to the re-use of previously developed land for renewable technology developments)."* Draft NPS EN-3, as noted above, also explains that *"land type should not be a predominating factor in determining the suitability of the site location"*.

3.3.42. Relatively little brownfield land is located within a sufficient distance of the West Burton to Bicker Fen 400kV line. The brownfield register (December 2022) maintained by North Kesteven District Council identifies five sites, all of which adjoin existing settlements and are under 8.3ha in size which would not be sufficient to deliver the capacity available within the grid connection offer. Furthermore, three of the five sites have obtained planning permission for residential development. Therefore, there is no suitable brownfield land within the district available to deliver renewable energy projects on the scale of the Proposed Development.

Summary

3.3.43. This section has provided a summary of the systematic process that the Applicant went through in determining suitable sites. Having identified the objective to deliver a large scale NSIP, to meet the pressing need for such projects in the UK and having regard to the general suitability of the Lincolnshire area for solar development, the Applicant identified two suitable overhead lines with spare capacity to deliver such a development and entered into discussions with NGESO about how to connect. Given the urgent need for renewable energy to address the climate crisis, this available capacity should be utilised (and made the most of) where it occurs.

3.3.44. The Applicant sought to identify willing landowners with large estates, capable of accommodating a large project on a site, within close proximity of existing overhead lines, which led to the identification of the Site. The Site is also suitable from a planning

and environmental perspective for solar, having regard to wider environmental constraints.

3.4. Alternative renewable technologies

3.4.1. Alternative types of renewable energy generation technologies such as wind and hydrogen were not considered by the Applicant. The Site is not considered to be suitable for onshore wind energy generation due to the low, flat typography of the Site which would likely give rise to significant landscape and visual effects, the high aviation use due to the proximity of RAF Waddington and RAF Cranwell which are both active RAF training bases which could potentially give rise to safety and aviation impacts, alongside the proximity to residential dwellings which may be subject to adverse effects associated with shadow flicker and wind turbine noise.

3.4.2. The Site was not considered suitable for hydrogen technology due to the construction and commercial viability for this type of energy generation in comparison to solar energy generation.

3.4.3. It is therefore considered that solar technology is the best renewable energy generating solution for the Site due to the low, flat typography.

3.5. Alternative solar technologies

3.5.1. The parameters of the DCO application will maintain a degree of flexibility to allow for the latest solar technology to be utilised at the time of construction. However, several alternative solar technologies and design options have been considered throughout the design process to date and several options have been discounted. The reasoning for discounting the solar technologies and design options is detailed in **Table 3.1** below.

Table 3.1 Solar PV configuration

Configuration type	Reason for rejection
Tracker panel	Tracker Panels have been discounted based on the landscape and visual impacts due to the increased height in comparison to fixed panels. Although small areas of the Site were considered suitable to support tracker panels, the majority of the Site was considered unsuitable due to anticipated visual effects. It was therefore considered that installing tracker panels solely within these small areas, in comparison to a complete fixed panel installation across the entire Site, would not be commercially viable and would lead to greater environmental effects, particularly from a landscape and visual and glint and glare perspective.

Configuration type	Reason for rejection
East – west fixed	East-west fixed panels have the benefit that they have a different energy production curve, with energy production higher in the evening and the morning. The benefit of east-west fixed panels would not be considered a benefit for this Site due to the inclusion of a Battery Energy Storage System (BESS) as part of the Proposed Development, which will help introduce a level of flexibility around the energy production and will allow the storage and distribution of energy when required throughout the day and during peak hours. East – west fixed panels have also been discounted as they reduce the potential for biodiversity net gain and enhancements due to the reduced space between the panels. The reduced space between the panels would significantly reduce the level of light reaching the ground and would limit any biodiversity planting beneath the panels. The increased coverage and decrease of spacing between the panels for east – west fixed panels in comparison to south facing fixed panels would also lead to an increase in water accumulation on a smaller area of the Site, which would increase run-off.

3.6. Alternative layouts

3.6.1. The design and layout of the Proposed Development has formed part of an iterative process which has been informed by the ongoing environmental assessment process, site selection assessment and taking into consideration the design principles and controls, non-statutory consultation feedback and engagement with stakeholders and consultees.

3.6.2. Engagement has included a series of collaborative design workshops, focused workshops with residents, technical meetings with statutory consultees and meetings with North Kesteven District Council and Lincolnshire County Council. The feedback from the engagement held to date has informed the ongoing design development.

3.6.3. The layout of the Proposed Development will continue to be developed as part of the environmental assessment process and will have regard to outputs from engagement with stakeholders and consultees and feedback from statutory consultation.

3.6.4. A Consultation Report will be submitted in support of the DCO application, which will provide a summary of consultation feedback and how the Applicant has had regard to the feedback in developing the design. A Design Statement will also be prepared and submitted in support of the DCO application which will set out the evolution of the Proposed Development design.

3.6.5. The layout and extent of the Proposed Development has been through two stages of design iterations to date. The first stage of design (Stage 1) was held prior to the public launch of the Proposed Development and informed the design of the Proposed Development for non-statutory consultation and EIA scoping. The second stage of design (Stage 2) relates to the design that has been presented within this PEIR to inform statutory consultation.

3.6.6. The two stages of the design development are discussed further below.

Stage 1 Design

Solar PV development

3.6.7. Following the identification of the Site as outlined above in this chapter, the available land within the Site boundary was subject to an initial assessment to identify suitability for Solar PV development and suitable locations for the BESS and Springwell Substation. The assessment focused on the suitability of land parcels based on environmental, social and economic factors. Minimum offsets to landscape and ecological features, as described in **Table 4.4** in **Chapter 4**, were agreed by the design team to inform the design process.

3.6.8. Following the initial assessment, which included desktop assessments and visits to the Site, the design team identified fields within the Site boundary that were considered unsuitable for accommodating Solar PV development and were therefore discounted. The reasoning for discounting these fields during Stage 1 of the design is detailed within **Table 3.2** below and should be read in conjunction with **Figure 3.2** as provided in **Volume 2** of this PEIR.

Table 3.2 Alternative layouts considered at Design Stage 1 and reasons for rejection

Field	Reason for rejection
C1, C2, C3	The extent of solar development in the north of Springwell East, adjacent to the B1188, was removed to reduce the potential impacts on the landscape character and visual setting of Blankney from the B1188 and due the proximity to the

Field	Reason for rejection
	Blankney Conservation Area and to set back development from the existing Spires and Steeples PRoW.
Md05, Md06	The fields directly to the north of Scopwick were removed due to the proximity to the residential settlement of Scopwick and the visibility to the Scopwick Cemetery and the adjacent children's playground and communal open space.
By01	The northernmost field that forms part of Springwell East was removed due to the presence of high quality grassland that is suitable for reptiles.
C10	The field to the south of Springwell East, directly north of Kirkby Green, was removed due to the visual proximity from residential dwellings and potential impacts on the landscape setting of the village.
Bk13, Bk17, Bk18	The fields immediately south of Scopwick were removed due to the topography of the land which rises to the south as well as the proximity to residential properties and the setting of Scopwick village and the Conservation Area.
Bk03	The field located directly south of Heath Road was removed due to direct views from Heath Road as part of the approach into Scopwick from the west and the proximity and foreground of views towards Scopwick Mill which is a key local landmark and heritage asset.
E1a, E2	The fields directly to the north of Brauncewell village were removed from the area of development to reduce the impacts on the setting of Brauncewell Medieval village scheduled monument and line of sight to the Grade II listed Brauncewell Church.

3.6.9. The areas that were removed for development were retained within the Site for potential mitigation, enhancement or retained agricultural use.

Battery Energy Storage System

3.6.10. During the Stage 1 initial appraisal, the design team also carried out an assessment to identify fields that would be suitable for the Collector Compounds and BESS based on the information available at the time of the assessment. The areas that were considered suitable for the BESS and Springwell Substation were areas that could accommodate infrastructure up to 6m in height. The following factors have informed the development of the design:

- Proximity and visual impact to the residential settlements of Blankney, Scopwick, Kirkby Green, RAF Digby, Rowston Top, Scopwick Low Field Farm and Slate House Farm and Cottages;
- Impact on the setting of Scopwick Conservation Area;
- Landscape setting and visibility from Heath Road;
- Views towards Blankney and Scopwick from the Steeples and Spires Trail;
- Impact on the setting of Grade II listed Scopwick Mill;
- Flood Zone 2 or 3; and
- Proximity and location of PRoW, particularly in Springwell East where several PRoW cross fields.

Springwell Substation

3.6.11. The Stage 1 initial appraisal also involved an assessment, based on site visits, surveys and desk-based studies available at the time, to identify areas that would be suitable for the location of the Springwell Substation. The areas that were identified as suitable were chosen due to the topography and screening from existing woodlands or tree belts that may help to reduce the landscape and visual impact of both structures.

Stage 2 design

3.6.12. Following the non-statutory consultation held in January - March 2023, the Stage 1 design was reviewed and revised to take account of the consultation feedback and the emerging results from various environmental surveys.

3.6.13. This process involved undertaking a detailed environmental appraisal, targeted engagement with statutory consultees and stakeholders, alongside several technical design workshops.

3.6.14. Following the Stage 2 design process, several fields were discounted from the area of Solar PV development. **Table 3.3** provides a summary of the fields that have been discounted and the reason for rejection. The majority of the fields were removed due to a combination of environmental factors.

3.6.15. Following the removal of the fields detailed below, the remaining area that was considered suitable to accommodate Solar PV development equates to approximately 816ha. The areas that were removed for development have been retained within the Site for potential mitigation, enhancement or retained agricultural use.

3.6.16. Opportunities to provide environmental enhancement and/or community benefits were also identified as part of the Stage 2

design process. Consequently, there was a minor amendment made to the Site boundary to account for a proposed new permissive path to connect Scopwick and RAF Digby.

3.6.17. As a result of the Stage 2 design process, a revised layout and initial green infrastructure plan for the Proposed Development was produced. These are provided in **Figure 2.3** and **Figure 2.5**, respectively. This design has formed the basis for this PEIR.

3.6.18. **Figure 3.2** details the areas of Solar PV development included at Stage 1 which informed the EIA Scoping Report in comparison to Stage 2 design for the PEIR.

3.6.19. The design will continue to be refined prior to submitting the DCO application in order to give regard to feedback from statutory consultation, stakeholder engagement and the findings of further environmental and technical assessments.

Table 3.3 Alternative layouts considered at Stage 2 design and reasons for rejection

Location	Reason for rejection
Lf09, Lf03, By27, By18	Fields that were identified as comprising solely of Grade 1 or 2 land were removed from the area of Solar PV Development to reduce the impact on BMV agricultural land.
Bcd141, W2, Bcd111, Bcd120, Bcd108, Bcd100, Bcd079, Rw10, Rw11, Rw12, Rw08, Rw07, Rw06, Rw05, Rw04, Rw02, Bk01, Bk07, Bk08, Bk09, Bk10, Bk11, Bk12, Lf10, By05, C4, Lf13, Lf16, Lf12, By13, By16, Md03, Lf10	Fields that comprised of majority BMV agricultural land were reviewed to identify whether those parts of the field that contained BMV could be removed, whilst retaining the non-BMV parts of the field. In some cases, part of the field was removed in combination with other environmental impacts as identified in this table.
Bcd141, Rw10, Rw11, Rw12, Rw06. Rw04, Bcd079, Bk07, northern section of Bk06, Bk15, Bk08, Md04, C7, Lf12, By12	Following the completion of the geophysical survey, fields that were identified as having high archaeological potential were removed in conjunction with other environmental impacts identified within this table.
C7, Md03, Md03	The fields located to the west of the Steeples and Spires PRoW, adjacent to the B1188, were removed during Stage 2 of the design to reduce the impact on the landscape character and visual settings towards Blankney and Scopwick from the PRoW, alongside views of Scopwick Church from the B1188.

Location	Reason for rejection
Lf12, Lf13, By16, C7, Md04, Md03	Following further survey work and site visits, several fields were removed from the area of Solar PV development due to the high landscape and visual impacts on PRoW, particularly the Steeples and Spires Trail and Trundle Lane, to reduce the cumulative impact of the Proposed Development, in conjunction with other impacts identified within this table.
Bcd088, Bcd079, Bcd118, Bcd108, Rw12, Rw11, Rw10, R108, Rw07, Rw05, Rw04, Rw02, Bk07, Bk10, Lf12, Lf13, Lf16, By05, By13	Following feedback from consultation and initial site visits to neighbouring properties, a residential visual amenity assessment was undertaken. This assessment identified areas of the Site to be removed due to a combination of particularly high residential amenity impacts and landscape and visual impacts for the property. The extent of the removal of Solar PV development was reviewed for each individual location to provide a suitable offset.
Bcd110, Bcd111, Bcd120, By05, By13	The fields located to the east of the B1191 in Springwell West that are located within an area of Flood Zone 2 and 3 were removed from the area of Solar PV development, in conjunction with other reasoning identified within this table.
Sections of particular fields were removed, including an area within the fields Bcd106, Bcd107, Bcd104, Bcd115, Bcd108, Bcd118, Bcd128	During the Stage 2 design, fields were removed from the area of Solar PV development to provide areas for mitigation and habitat connectivity across the Site.

Battery Energy Storage System

3.6.20. Following the Stage 2 design and further survey work, a further assessment was carried out to review and identify suitable locations for the BESS. The assessment discounted further locations across the Site due to the potential landscape and visual impacts and access requirements. The outputs of this assessment helped to inform the design decision to discount the option of distributed BESS across the Site, due to the fact that there were limited locations deemed suitable for distributed BESS in Springwell East and Central, particularly due to landscape and visual impacts and the proximity to the residential settlements of Blankney and Scopwick.

3.6.21. The two potential locations in the north and south of Springwell West for the consolidated BESS are provided in **Figure 2.3**.

3.6.22. It is anticipated the one location will be selected as the design progresses and will be presented and assessed within the ES.

Springwell Substation

3.6.23. Following the Stage 2 design development and outputs of the environmental surveys undertaken to date, the location of the Springwell Substation was refined. The options of locating this infrastructure to the south of Springwell West and in the centre of Springwell West, adjacent to the A15, were discounted.

Underground cabling

3.6.24. The siting zone for the Grid Connection Corridor is presented in **Figure 2.3**. Given the short connection length, this corridor has been chosen as it is the most direct route to minimise impact on the land, whilst avoiding key environmental constraints, including Gorse Hill covert. Any alternative route would unnecessarily increase the length of the Grid Connection cable route, involve further road crossings and associated environmental effects.

3.6.25. The Grid Connection Corridor forms the area that is being considered for the location of the Grid Connection cable route. The Grid Connection cable route is subject to an iterative design process informed by ongoing environmental and engineering surveys and engagement with landowner(s) and stakeholders. The location of the Grid Connection cable route will be refined following engagement and further survey work. The refined Grid Connection cable route will be presented in the ES.

3.6.26. The indicative location of the cabling routes between each parcel of land has been informed by the embedded mitigation measures (**Table 4.4** of **Chapter 4**) alongside a detailed review and assessment of known environmental features, including the location of trees, hedgerows and areas of high archaeological potential.

3.6.27. There are several cabling route options within the Site that connect each parcel, as displayed within **Figure 2.7**, which will be refined as the design progresses.

4. Approach to EIA

4.1. Introduction

4.1.1. This chapter sets out the overall approach taken to the EIA for the Proposed Development.

4.1.2. As part of the EIA process, this PEIR outlines the work undertaken to date and identifies preliminary likely significant environmental effects of the Proposed Development, based on the environmental baseline information currently available and the preliminary design parameters for the Proposed Development.

4.1.3. The preliminary design of the Proposed Development, as presented in this PEIR, has been informed by the ongoing EIA process and consultation responses. Further survey and design work is currently being undertaken to refine the design and to inform the final assessment of likely significant environment effects of the Proposed Development which will be reported within the ES.

4.1.4. The information presented in this PEIR is 'preliminary'; and the Applicant is therefore actively seeking consultees' comments so that it can have regard to feedback as it progresses the design of the Proposed Development and the EIA.

4.2. Overview of the EIA process

4.2.1. An EIA is a systematic process that examines the likely significant effects (beneficial or adverse) on the environment resulting from the construction, operation (including maintenance) and decommissioning of a proposed development. The findings of an EIA are presented in a document called the Environmental Statement (ES), which is used to report to decision makers, consultees and stakeholders on the likely significant environmental effects of a development and helps the decision maker (in the case of a Development Consent Order, the Secretary of State) determine the application for consent.

4.2.2. The main stages of the EIA process are as follows:

- EIA Screening: Screening is undertaken to determine whether a proposed development constitutes 'EIA Development', in cases where there is uncertainty if a project requires an EIA to be undertaken. However, as noted in **Section 1.2** of **Chapter 1**, the Applicant notified the Secretary of State under Regulation 8(1)(b) of the EIA Regulations that they propose to provide an ES in respect of the Proposed Development and by virtue of Regulation

6(2)(a)[33], the Proposed Development is considered 'EIA development', thus requiring an EIA.

- EIA Scoping: EIA Scoping refers to the process of identifying the scope of the assessment for the development with the relevant decision maker (in the case of a DCO, PINS on behalf of the Secretary of State).
- PEIR: The Preliminary Environmental Information Report, as stated in Regulation 12(2) of the EIA Regulations, is to provide sufficient information to enable consultation bodies to develop an informed view of the likely significant environmental effects of the development being proposed. The Planning Inspectorate's Advice Note 7[34] (Section 8.4) states that there is no prescribed format as to what preliminary environmental information should comprise and it is not expected to replicate or be a draft of the ES. However, it also states that if the Applicant considers this to be appropriate (and more cost-effective) it can be presented in this way. A good PEIR is one that enables consultees (both specialist and non-specialist) to understand the likely environmental effects of the proposed development and helps to inform their consultation responses on the proposed development during the pre-application stage.
- ES: The ES presents the results of the EIA undertaken for the project and sets out the likely significant environmental effects that would result from the Proposed Development, alongside the proposed mitigation measures to avoid, prevent, reduce or, if possible, offset any identified significant adverse effects on the environment. An ES is submitted as part of an application for development consent and is taken into account during the decision making process.

4.3. Scoping

4.3.1. EIA Scoping is the process of identifying the factors to be considered within the ES and establishing the receptors/matters that will comprise the scope of the assessment. The applicant submits a scoping report setting out a description of the proposed development and an explanation of the likely significant effects of the development on the environment and requests that the Secretary of State states in writing their opinion as to the scope and level of detail of the information to be provided in the ES. Although scoping is not a mandatory requirement under the EIA Regulations,

[33] The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, Regulation 6(2)(a). Available online: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk).

it is recognised as a useful preliminary procedure which helps to identify the main effects that a development is likely to have on the environment, taking into account responses from prescribed consultees.

4.3.2. An EIA Scoping Report was prepared by the Applicant in respect of the Proposed Development and a Scoping Request was submitted to the Planning Inspectorate on 22nd March 2023 with a request for the Secretary of State to adopt a Scoping Opinion in relation to the Proposed Development. In considering the request for a scoping opinion, the Secretary of State consulted with the relevant prescribed consultees. The Scoping Opinion was issued by the Planning Inspectorate on 2nd May 2023. The EIA Scoping Report and Scoping Opinion are provided in **Volume 3**, **Appendix 4.1** and **Appendix 4.2**.

4.3.3. A table outlining the Scoping Opinion Response and how the PEIR, ES and other reports that will be submitted in support of the DCO application will address these points is provided in **Volume 3**, **Appendix 4.3**.

4.3.4. Following receipt of the Scoping Opinion and consultee responses, engagement has been undertaken with stakeholders to clarify and inform further EIA work to be undertaken to inform this PEIR and the ES. A summary of the scope which has been assessed in this PEIR having full regard to and reflecting the Scoping Opinion is presented in **Table 4.1**.

Table 4.1 Summary of the scope of this PEIR

Environmental factor	Inclusion within the PEIR	Justification/location within this PEIR
Air quality	Yes – Scoped in	Chapter 5
Biodiversity	Yes – Scoped in	Chapter 6
Climate	Yes – Scoped in	Chapter 7
Cultural heritage	Yes – Scoped in	Chapter 8
Landscape and visual	Yes – Scoped in	Chapter 9
Land, soils and groundwater	Yes – Scoped in	Chapter 10
Noise and vibration	Yes – Scoped in	Chapter 11
Traffic and transport	Yes – Scoped in	Chapter 12
Water	Yes – Scoped in	Chapter 13

Environmental factor	Inclusion within the PEIR	Justification/location within this PEIR
Cumulative effects	Yes – Scoped in	Chapter 15
Glint and glare	Yes – Scoped in	A preliminary assessment of glint and glare has been undertaken to inform the design of the Proposed Development, as reported within **Chapter 14** of this PEIR. A detailed glint and glare assessment will be appended to the ES and will inform the assessment of relevant topics.
Heat and radiation	No – Scoped out as a separate chapter	The Planning Inspectorate has agreed that heat and radiation can be scoped out of further assessment. However, the ES will include a brief outline and signposting to any known identified sources of heat (and radiation) and detail how this has been considered in the design of the Proposed Development presented in the ES.
Major accidents and disasters	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that major accidents and disasters can be scoped out of further assessment. However, the ES will clearly signpost where these impacts are assessed in other relevant chapters and where any relevant mitigation measures are secured, if required. A Battery Safety Commitments Plan will be submitted in support of the DCO application.
Utilities	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that utilities can be scoped out of further assessment. Additional mitigation measures to protect against interference with below ground utilities during construction will be documented within and secured by the Outline Construction Environmental Management Plan.

Environmental factor	Inclusion within the PEIR	Justification/location within this PEIR
Human health	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that human health can be scoped out of further assessment. However, the ES will clearly cross reference to where human health impacts (dust, noise) are assessed in other relevant chapters (air quality, noise and vibration)
Material assets	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that material assets can be scoped out of further assessment. It is noted that borrow pits are no longer being considered as part of the Proposed Development. The ES will detail the proposed waste arisings and will confirm the cut and fill balance.
Waste	No - Scoped out as a separate chapter	The Planning Inspectorate has agreed that waste can be scoped out of further assessment. However, in accordance with the Scoping Opinion, the ES will include further detail on the waste impacts for the decommissioning phase and outline how any impacts will be mitigated and managed through measures documented within and secured by the Outline Decommissioning Environmental Management Plan and the Outline Site Waste Management Plan.
Socio-economics	No - Scoped out as a separate chapter	The Scoping Opinion considers that the ES should consider both the positive and negative socio-economic impacts of the Proposed Development, including the cumulative loss of agricultural operations within the region. The use of BMV agricultural land is addressed within **Chapter 10** of this PEIR. The Scoping Opinion considers that the ES should assess impacts to

Environmental factor	Inclusion within the PEIR	Justification/location within this PEIR
		PRoW and on walkers, cyclists and horse riders from the Proposed Development such as the need for temporary closures or diversions, or reduction in amenity, where significant environmental effects are likely to occur. Impacts on users of PRoW are considered within **Chapter 9: Landscape and Visual** and **Chapter 12: Traffic and Transport** of this PEIR. A Socio-Economic Statement which highlights the positive socio-economics impacts of the Proposed Development on the local and regional area will be submitted in support of the DCO application.
Electric, Magnetic and Electromagnetic Fields (EMF)	No - Scoped out as a separate chapter	The Grid Connection cabling, which forms part of the Proposed Development, exceeds 132kV and therefore has the potential to cause electromagnetic fields with adverse effects on human health. The Grid Connection cabling will be buried underground at a suitable depth in accordance with the relevant guidance[35]. Therefore, electromagnetic fields are unlikely to have any adverse effects on residential receptors.

4.4. Consultation and engagement

4.4.1. Consultation and engagement alongside the EIA process is critical to the development of a comprehensive and proportionate ES. The views of statutory and non-statutory consultees are important to ensure that the EIA from the outset focuses on specific issues where significant environmental effects are likely, and where further investigation is required.

[35] Department of Energy and Climate Change (2012). Demonstrating compliance with EMF public exposure guidelines: voluntary code of practice. Available online: The Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (legislation.gov.uk)

4.4.2. Consultation and engagement, as an ongoing process, enables design evolution and embedded and additional mitigation measures to be incorporated into the Proposed Development to limit adverse environmental effects and optimise environmental benefits.

4.4.3. Early engagement with consultees has been important in influencing the design process of the Proposed Development to date. There is ongoing engagement with consultees to seek an appropriate level of feedback, to ensure that comments are considered in the evolving design and this PEIR forms an important part of this process. The consultation responses will be recorded in a Consultation Report and design development detailed within the Design Statement which will be submitted in support of the DCO Application.

4.4.4. The Applicant has undertaken targeted engagement with statutory consultees and a variety of representative local groups to gather views to help develop the design of the Proposed Development at an early stage to enable the sharing and consideration of local knowledge. These stakeholders included Lincolnshire County Council, North Kesteven District Council, local parish councils, statutory environmental consultees and local interest groups.

4.4.5. Non-statutory consultation was held in January - March 2023. The Applicant has also held collaborative meetings with residents, which involved meeting with a small group of near-neighbours, which were held on 12th, 13th and 15th June 2023 to present and discuss the progress of the design. The outputs of the meetings were taken into account to inform the ongoing design of the Proposed Development.

4.4.6. Regard will also be had to feedback received through the statutory consultation and from ongoing engagement to inform the ongoing design and EIA process.

4.4.7. The Consultation Report will provide a summary of consultation feedback and how the feedback has been taken into account in development of the design and mitigation.

4.4.8. As part of the EIA process, consultation and engagement is ongoing with a range of statutory and non-statutory consultees to help inform the design of the Proposed Development.

4.4.9. Several meetings have been held with consultees to provide further information on the Proposed Development design and survey progress and to agree the approach to the methodology for environmental surveys and assessment. The following consultees that have been liaised with to date, include (but not limited to):

- Lincolnshire County Council;
- North Kesteven District Council;
- Parish Councils;

- The Planning Inspectorate;
- Historic England;
- Natural England;
- Environment Agency;
- National Highways;
- Lincolnshire Wildlife Trust;
- RAF Digby; and
- Lincolnshire Fire and Rescue.

4.4.10. The consultation and engagement undertaken for each of the environmental factor assessments is provided in further detail in **Chapters 5-14** of this PEIR.

4.5. Good design and Project Principles

4.5.1. Design should be considered as a process and an outcome and the importance of good design for NSIPs is championed in national policy, including Draft NPS EN-1 and Draft NPS EN-3 which set out criteria for achieving good design. Supporting consideration of good design for infrastructure projects, and referred to in the Draft NPS EN-1, the National Infrastructure Commission's (NIC) 'Design Principles for National Infrastructure' identifies the purposes of the design process is to bring together engineering, environmental and creative expertise to shape and deliver a development project. The document notes that "*design is as much about process as it is product. Imaginative thinking about design should be embedded at every step of planning and delivery. The principles ensure a good process leads to a good design outcomes.*"

4.5.2. The document sets out four thematic principles to shape the design of NSIPs. These are:

- Climate - Mitigate greenhouse gas emissions and adapt to climate change.
- People - Reflect what society wants and share benefits widely.
- Places - Provide a sense of identity and improve our environment.
- Value - Achieve multiple benefits and solve problems well.

4.5.3. These thematic principles have informed the wider Project Objectives for Springwell under which The Project Principles have been developed. These are:

- Climate - Make efficient use of our land to increase the supply of clean, secure and affordable energy in the UK.

- People - Be a good neighbour by respecting others, working considerately and recognising our place within the community.
- Place - Design a layout that responds to the distinctive character of the local environment and creates opportunities to deliver recreational, landscape and ecological enhancements.
- Value - To work closely with the communities in which the project is located to ensure that benefits are shared locally'.

4.5.4. Good design has been a fundamental consideration from the outset. The following Project Principles (**Table 4.2**) have been identified to ensure good design outcomes are embedded within the Proposed Development from the very start. These will be tested and refined as part of the EIA and DCO process. Engagement has been held with several statutory consultees including, North Kesteven District Council, Lincolnshire County Council, Natural England, Lincolnshire Wildlife Trust and the Environment Agency, whereby the project principles were discussed.

Table 4.2 Project Principles

Strategic Principles	Project Principles
1. Design places that support and enhance local communities	**1.1** Engage openly, transparently and meaningfully with stakeholders taking their feedback into account and making use of local knowledge to improve our project. **1.2** Provide appropriate offsets to local settlements and dwellings on a case-by-case basis, respecting their individual amenity. **1.3** Consider sequential views and the experience of people using Heath Road and other local roads. **1.4** Work with Blankney Estates and other landowners to secure the long-term management of both the agricultural landscape and benefits provided by the scheme. **1.5** Identify opportunities for wider community benefits in consultation with local stakeholders.
2. Lead with the landscape	**2.1** Retain existing vegetation wherever reasonably possible to retain the fabric of the site and aid assimilation of development into its context. **2.2** Design the development to respond to the distinctive and unique local character of the site, informed by relevant local studies such as North Kesteven landscape character assessment. **2.3** Maintain the rural separation between the villages of Ashby de la Launde, RAF Digby, Scopwick and Blankney.

Strategic Principles	Project Principles
	2.4 Conserve the significance of heritage assets including Scopwick Mill and Ashby Walled Gardens. **2.5** Protect the setting of the Scopwick and Blankney conservation area.
3. Increase biodiversity appropriate to the landscape character and connect nature	**3.1** Extend and enhance existing local wildlife sites and priority habitats, including the creation of calcareous grassland adjacent to the A15. **3.2** Create a mosaic of habitats, such as new grassland and arable margins, to support farmland birds such as skylark and grey partridge and species such as brown hare. **3.3** Use locally native species wherever possible to create new habitats, increase the number of pollinator species and create food sources for birds such as skylark and yellow hammer during winter months. **3.4** Use land under and between solar panels to deliver biodiversity benefit for pollinators and farmland birds. **3.5** Establish new planting and landforms at the earliest practicable opportunity. **3.6** Deliver a substantial biodiversity net gain beyond the minimum of 10%.
4. Make efficient use of the land, touch it lightly	**4.1** Optimise generation and export capacity of the solar farm within the constraints of the site to make the most efficient use of the land and available grid connection. **4.2** All internal access tracks and cable routes will use existing tracks, crossings and/or gaps in the hedgerows wherever practicable. **4.3** Cabling routes will run alongside access tracks as much as possible to avoid wider excavations. **4.4** Fences will be designed to integrate with the local environment, allow for the movement of wildlife and meet the functional requirements of the project. **4.5** Minimise the use of concrete and foundations where practicable.
5. Provide new ways to enjoy the countryside that go beyond the lifetime of the scheme	**5.1** Retain all existing PRoW where practically possible. **5.2** Protect the amenity of the Spires and Steeples trail, avoiding any solar development between the route and the B1188. **5.3** Consider sequential views and the experience of people using the Stepping Out Walks and other local footpaths. **5.4** Enhance the footpath and cycle network by providing new and improved routes to increase connectivity and link local settlements such as RAF Digby, Scopwick and Blankney.

Strategic Principles	Project Principles
6. Improve economic resilience through education and by boosting the UK supply chain	**6.1** Foster innovation and extend supply chain to leave a lasting legacy value for Lincolnshire and the UK. **6.2** Provide education and interpretation of the solar farm and the Site.
7. Manage water, improve quality, reduce pollution	**7.1** Slow the flow of water within the site to improve flood resilience. **7.2** Apart from Solar PV modules, no built structures (central inverters, substation and collector compounds) will be located within Flood zones 2 or 3. Solar PV modules will be above the maximum flood height level.
8. Support agricultural productivity	**8.1** All fields comprising solely of Grade 1 or 2 land within the site will remain in arable production. **8.2** Prioritise the use of BMV agricultural land for arable production where practicable. **8.3** Where not used for Solar PV development, BESS or Springwell Substation, prioritise the use on non-BMV agricultural land for the creation of legacy/permanent habitats where practicable.
9. Build resilience in a changing climate	**9.1** Design for resilience and adaptation to future climate change.
10. Ensure responsible construction, ongoing maintenance and decommissioning	**10.1** Behave as a considerate neighbour through both construction and operation. **10.2** Provide clear lines of communication between the developer and the local community. **10.3** Prioritise sustainable resource management and techniques and minimise carbon emissions throughout the project lifecycle.

4.6. Approach to the preliminary assessment

Design Principles, uncertainty and flexibility

4.6.1. The design of the Proposed Development is ongoing and the PEIR provides a preliminary environmental assessment of the design to date.

4.6.2. In order to maintain flexibility in the design, a 'Rochdale Envelope' approach within parameter ranges is being taken. The Planning Inspectorate's Advice Note Nine 'Rochdale Envelope'[36] provides specific guidance to applicants on the degree of flexibility that could be considered appropriate under the Planning Act 2008 regime.

4.6.3. The Rochdale Envelope is an acknowledged way of dealing with an application comprising EIA development where details of a project have not been fully resolved by the time the DCO application is

[36] Planning Inspectorate (July 2018) Advice Note Nine: Rochdale Envelope (Version 3). Available online: Advice Note Nine: Rochdale Envelope | National Infrastructure Planning (planninginspectorate.gov.uk)

submitted. The term is used to describe those elements of a scheme that have not yet been finalised, but can be accommodated within certain limits and parameters, allowing the likely significant environmental effects of a project to be presented as a reasonable 'worst case'.

4.6.4. The preliminary design parameters for the Proposed Development for the purpose of the preliminary assessment of likely significant environmental effects are as set out in **Chapter 2: Description of the Proposed Development**.

4.6.5. At this stage of the design of the Proposed Development, there is also various optionality within the design. **Table 4.3** below sets out those elements of the Proposed Development for which optionality is present within the current design. **Table 4.3** also sets out the scenario assessed for the purpose of this PEIR. This scenario has been adopted for the environmental factor assessments presented in **Chapters 5-14**, unless otherwise stated within the environmental factor chapter.

Table 4.3 Optionality of project elements at PEIR stage

Project Element	Optionality	Scenario assessed for PEIR
Solar PV modules	The indicative area for Solar PV Modules is shown in light blue on the Zonal MasterPlan (**Figure 2.3**). Some of these areas overlap with Indicative Siting Areas for the BESS, Collector Compounds and Springwell Substation hence there is optionality within these areas; Solar PV Modules may or may not occur within these areas depending on the preferred location of the BESS, Collector Compounds and Springwell Substation.	Assumes Solar PV modules would be located within all Solar PV fields marked in light blue on the Zonal MasterPlan (**Figure 2.3**) to assess the potential maximum extent of development. Height parameters for the Solar PV Modules would be up to 3m, 3.5m and 4m as shown in the Height Parameter Plan in **Figure 2.4**.
Balance of Solar System	The location of the BoSS has not yet been defined. Generally, the BoSS would comprise locating the inverter, transformer and switchgear equipment, independently outdoors, or within an enclosed ITS located throughout the fields shown in light blue on the Zonal MasterPlan (**Figure 2.3**). Some of these areas overlap with Indicative Siting	Assumes that the BoSS equipment would be located in an ITS that would be located within each Solar PV field as marked in light blue on the Zonal MasterPlan (**Figure 2.3**). Assessment of BoSS height (up to 3.5m) has not been specifically addressed across the Solar PV fields. Height across the Solar PV fields has

Project Element	Optionality	Scenario assessed for PEIR
	Areas for the BESS, Collector Compounds and Springwell Substation - hence there is optionality within these areas; BoSS may or may not occur within these areas depending on the preferred location of the BESS, Collector Compounds and Springwell Substation. The inverters required as part of the BoSS are expected to be either string inverters mounted underneath the Solar PV Modules or central inverters sited at regular intervals amongst the Solar PV Modules which would be located outdoors or within an enclosed ITS container.	been addressed as per the Solar PV Modules (up to 3m, 3.5m and 4m) as shown in the Height Parameter Plan in **Figure 2.4**.
Collector Compounds	Four Collector Compounds, one located within each of the Indicative Collector Compound Siting Zones shown on the Zonal MasterPlan (**Figure 2.3**). Assumes one Collector Compound within Springwell East, one within Springwell Central and two in Springwell West. There is overlap between the Collector Compound in the southern extent of Springwell West and the BESS Indicative Siting Zone in the same location. Assumes Collector Compounds could be sited anywhere within Indicative Siting Zone.	Assumes one Collector Compound within each of the Indicative Siting Zones shown on the Zonal MasterPlan (**Figure 2.3**). Height parameters for the Collector compounds are up to 6m as shown in the Height Parameter Plan in **Figure 2.4**. Collector compound siting within an Indicative Siting Zone is assumed to be closest to the nearest sensitive receptor for that particular assessment.
BESS	BESS located within any of the Indicative Siting Zones for BESS grid (zones located in close proximity to the Springwell Substation within the north of Springwell West, and zone located in the fields to the southern extent of Springwell West) shown on the Zonal	Assumes BESS is either located within 1) Indicative Siting Zone in the north of Springwell West, OR 2) within the Indicative Siting Zone in the southern extent of Springwell West. Both options have been assessed. Height parameters for the BESS Indicative Siting

Project Element	Optionality	Scenario assessed for PEIR
	MasterPlan (**Figure 2.3**). There is overlap between the BESS in the southern extent of Springwell West and the Collector Compound Indicative Siting Zone in the same location. Assumes BESS could be sited anywhere within the Indicative Siting Zones for BESS.	Zone in the southern extent of Springwell West are up to 6m as shown in the Height Parameter Plan in **Figure 2.4**. Height parameters for the BESS Indicative Siting Zone in the north of Springwell West reflect the higher Springwell Substation (up to 12m). BESS siting within an Indicative Siting Zone is assumed to be closest to the nearest sensitive receptor for that particular assessment.
Springwell Substation	Springwell Substation located within any one of the Springwell Substation Indicative Siting Zones (marked as A) on the Zonal MasterPlan (**Figure 2-3**). Assumes Springwell Substation could be sited anywhere within Indicative Siting Zone (marked A).	Assumes Springwell Substation is located within the A Zone shown on the Zonal MasterPlan (**Figure 2.3**). Height parameters for Springwell Substation are up to 12m as shown in the Height Parameter Plan in **Figure 2.4**. Springwell Substation siting within Indicative Siting Zone A is assumed to be closest to the nearest sensitive receptor for that particular assessment.
Main construction compounds satellite Construction compounds	Assumes three main construction compounds will be indicatively located in 1) Bcd128 (West); 2) either Tb1, T2 or Bcd082 (for BESS and substation); 3) either Md03, Md04 or C7 (for central and east) as shown on **Figure 2.8**. Assumes 5 satellite compounds at various potential locations including: Tb3, Tb4, Tb5	Assumes that one main construction compound and one satellite construction compound are located within each of the indicative siting zone locations displayed in **Figure 2.8**. Main construction and satellite construction compounds siting within an indicative siting zone location is assumed to be closest to the nearest sensitive receptor for that particular assessment.

Project Element	Optionality	Scenario assessed for PEIR
	Bcd139 Bcd093 or Bcd084 Bk04, bk06, bk07, bk11, bk12 By 18 or By27 as shown on **Figure 2.8**. There is overlap between these construction compound locations and various project elements as listed above within this table.	Access to the Site is assumed to be via the indicative access points as shown on **Figure 2.9**.
Grid Connection cable route	The siting zone for the Grid Connection cable route is presented in **Figure 2.3**.	This preliminary assessment has been based on the siting zone presented in **Figure 2.3** and the cable route is assumed to be closest to the nearest sensitive receptor for that particular preliminary assessment.
Cable route to connect the Solar PV modules, BoSS, Collector Compounds, Springwell Substation and BESS	The indicative location of the main cable route between the parcels and the potential routing options is presented in **Figure 2.7**.	The preliminary assessment has been based on all the cable route options outlined in **Figure 2.7**.

4.6.6. As the design of the Proposed Development evolves, further information will become available and key elements of the design will be refined and further defined, and the optionality will be reduced. However, it is likely that flexibility will need to be maintained for some aspects of the Proposed Development for the DCO application. Where flexibility is to be retained in the DCO application, the parameters will form the likely worst case envelope for the Proposed Development to be reported within the ES.

Defining the study area

4.6.7. Study areas have been defined individually for each environmental factor assessment, taking into account the geographic scope of the

potential impacts relevant to that factor and the information required to assess those impacts.

4.6.8. The proposed study areas are described within **Chapters 5-13** of this PEIR.

4.6.9. These study areas have also been used to inform the zone of influence for the purposes of assessing the cumulative effects, as detailed in **Chapter 15**.

Establishing baseline conditions

4.6.10. The baseline environment comprises the existing environmental characteristics and conditions, based upon desk-based studies and field surveys undertaken and information available at the time of the assessment.

4.6.11. The establishment of the environmental baseline is essential to assist with the comparison against future changes as a result of the Proposed Development and to assess the likely significant environmental effects of the Proposed Development.

4.6.12. Specific details of the approach taken to establishing baseline conditions are provided within **Chapters 5-13** of this PEIR. Typically baseline conditions have been established by:

- Site visits and surveys;
- Desk based studies; and
- Modelling.

4.6.13. The PEIR provides an overview of the current baseline for the purposes of the preliminary assessment as set out within **Chapters 5-13**. Where further studies or survey work will be undertaken as part of the ongoing EIA this is also outlined in **Chapters 5-13**. The reports detailing the results of further baseline studies or surveys will be provided within the ES.

Establishing future baseline conditions

4.6.14. Schedule 4(3) of the EIA Regulations requires consideration of the likely evolution of the current state of the environment (baseline scenario) in the absence of the Proposed Development, as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge (the ‘future baseline’).

4.6.15. Each environmental factor chapter (**Chapters 5-13**) provides a description of the future baseline scenario and the data sources that have informed it where relevant.

Assessment Scenarios

4.6.16. The assessment scenarios considered for the Proposed Development are as follows:

- Existing baseline (without Proposed Development) - Reported at the time that the baseline data has been collected.
- Future baseline (without the Proposed Development) – For comparison with the construction phase, operational phase, and decommissioning phase. It should be noted that without the Proposed Development, the Site would continue to be occupied for agricultural use.
- Construction of the Proposed Development - As presented in **Chapter 2**, construction is scheduled to commence in 2026 and last for approximately 48 months. Where relevant, environmental factor chapters have assessed the relevant 'worst case' construction scenario and where necessary, the relevant period or 'peak' of activity within the construction programme.
- Operation (which includes maintenance) of the Proposed Development – As presented in **Chapter 2**, it is assumed that the Proposed Development will be operational and maintained for a duration of 40 years. However, it is acknowledged that this could be slightly longer depending on the maintenance regime deployed for the Proposed Development as is the case for existing generating assets.
- Decommissioning of the Proposed Development (where appropriate) - As presented in **Chapter 2**, decommissioning activities will begin following the cessation of the operational Proposed Development and will take approximately 12 – 24 months.

Assessment of likely significant environmental effects

4.6.17. The EIA process requires the identification of the likely significant environmental effects of the Proposed Development.

4.6.18. The PEIR reports on the preliminary likely significant environmental effects for the construction (including site preparation and earthworks), operational (i.e. once completed and open to use, and including maintenance) and (where relevant) decommissioning phases of the Proposed Development based on information available to date.

4.6.19. The following criteria have been taken into account when determining significance for the purposes of the PEIR:

- The receptors/resources (natural and human) that would be affected and the pathways for such effects;
- The geographic importance, sensitivity or value of receptors/resources;
- The duration (short-term, medium-term or long-term); permanence (permanent or temporary) and changes in significance (increase or decrease);
- Reversibility - e.g. is the change reversible or irreversible, permanent or temporary;
- Environmental and health standards (e.g. local air quality standards) being threatened; and
- Feasibility and mechanisms for delivering mitigating measures, e.g. Is there evidence of the ability to legally deliver the environmental assumptions which are the basis for the assessment?

4.6.20. The method for assessing significance of effects varies between environmental factors and is derived from a variety of legislative requirements, technical guidance and the EIA Regulations, but in principle, this is based on the environmental sensitivity (or value/importance) of a receptor/resource and the magnitude of change from the baseline conditions.

4.6.21. The approach to assessing the significance of effects for each individual factor is summarised in **Chapters 5-14**. However, it is worth noting that for the preliminary assessment of likely significant environmental effects reported within this PEIR, the assessment is based on the current stage in the design process and the current understanding of baseline conditions. Further survey and design work is currently being undertaken to refine the design and to inform the final assessment of likely significant environment effects of the Proposed Development, which will be reported within the ES.

4.6.22. Summary of effect tables that summarise the preliminary likely significant environmental effects associated with each of the environmental factors are presented within **Chapters 5-13**. These tables outline sensitive receptors, the likely effects in the absence of additional mitigation measures, the likely additional mitigation measures, the likely residual effects (following the application of any additional mitigation measures proposed) and a preliminary assessment of whether the residual effect would likely be significant or not.

4.6.23. The approach taken to the preliminary assessment of cumulative effects is reported in **Chapter 15**.

Approach to mitigation

4.6.24. Mitigation can be relied on to reduce potential significant environmental effects from the Proposed Development. The sequential steps of the mitigation hierarchy are as follows:

- **Avoidance:** Take measures to avoid creating impacts from the outset;
- **Minimisation:** Measure taken to reduce the duration, intensity and extent of the impact if they cannot be avoided;
- **Restoration:** Measures taken to improve ecosystems following exposure to unavoidable impacts; and
- **Offset:** Measure taken to compensate for any residual impacts.

4.6.25. The Institute of Environmental Management and Assessment's (IEMA) 'Environmental Impact Assessment Guide to Shaping Quality Development'[37] refers to three distinct forms of mitigation:

- **Primary:** An intrinsic part of the project design
- **Secondary:** Typically described within the environmental factor chapters of the ES, but often are secured through planning conditions and/or management plans.
- **Tertiary:** Required regardless of any EIA, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral practices.

4.6.26. For the purposes of this PEIR and the ES, embedded 'primary' mitigation measures will form part of the Proposed Development that is the subject of the application for consent. **Table 4.4** describes the currently known embedded (primary) environmental mitigation measures that are considered to be an inherent part of the Proposed Development i.e. the technical requirements adopted to avoid or prevent adverse environmental effects, based on the design of the Proposed Development to date It should be noted that these will likely evolve over the course of the design evolution, up to submission of the DCO application.

Table 4.4 Embedded (primary) mitigation measures

Receptor/factor	Embedded (primary) mitigation
Residential properties	There will be a minimum 250m offset from ITS, BESS, Project Substations and Collector Compounds to residential properties.

[37] Institute of Environmental Management and Assessment (2015). Environmental Impact Assessment Guide to Shaping Quality Development.

Receptor/factor	Embedded (primary) mitigation
Hedgerows	Boundary fencing will not be constructed through existing hedgerows or across ditches. There will be a minimum 10m offset from the Proposed Development to all existing hedgerows. Internal access tracks and cable routes will use existing tracks, hedgerow crossings and/or gaps in the hedgerows wherever practical. Proposed hedgerows will be planted with a variety of fruiting and nut bearing species providing foraging opportunities.
Woodlands	There will be a minimum 15m offset from built development to existing woodlands, whilst noting that it is possible that individual trees may need to be removed to facilitate construction. There will be a minimum 20m offset from the Proposed Development to ancient woodland.
Designation sites for nature conservation	There will be a minimum 20m offset from the Proposed Development to statutorily and non-statutorily designated sites for nature conservation.
Biodiversity	Exceed 10% Biodiversity Net Gain on Site. There will be a minimum 30m offset from the Proposed Development to main badger setts.
Land, soils and groundwater Cultural heritage	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. Cable routes to connect the Solar PV modules to the BoSS and Collector Compounds will run alongside access tracks as much as possible to avoid wider excavations. The use of use of trenches and foundations will be minimised. Utilise easily removable foundations.
Watercourses and ditches	Provide offsets of at least 10m either side from main rivers and 6m from ditches.
Public rights of way	All existing PRoW will be retained where practically possible in their existing alignment during the operation of the Proposed Development. There will be a minimum 50m offset of ITSs from PRoW. The Proposed Development (excluding new landscaping where appropriate) will be set back at least 15m either side from existing or proposed PRoW, except where crossings are necessary.
Climate	All members of the supply chain will provide a carbon reduction plan.

Receptor/factor	Embedded (primary) mitigation
	All suppliers will meet the Applicant's tendering, procurement and supply chain requirements. The Applicant's continued adherence to PV Cycle requirements. The use of concrete will be minimised.
Agricultural land	All fields comprising solely of Grade 1 or 2 land within the Site will remain in arable production.
Landscape	Structural planting is to consist of native and indigenous species and wherever possible from local provenance.

4.6.27. These embedded (primary) environmental mitigation measures should not be confused with additional (secondary and tertiary) mitigation measures proposed in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment, which are described under the 'Additional Mitigation Measures' section within each environmental factor assessment chapter (**Chapters 5-13**).

4.6.28. Mitigation will be secured through the DCO process to ensure that all measures are delivered as part of the Proposed Development. Measures are expected to be secured through the setting of specified parameters and via DCO requirements.

Opportunities for enhancing the environment

4.6.29. Where possible, there will be a commitment to identifying opportunities for enhancement within the relevant environmental factor assessments. Enhancement is defined as '*a measure that is over and above what is required to mitigate the adverse effects of a project*'. Therefore, any identified enhancement measures will not be taken into account when determining the significance of effects.

4.6.30. Environmental enhancement measures have been reported where known at this stage within this PEIR, and will continue to be considered as part of the ongoing design process and will be reported in full within the ES.

Monitoring

4.6.31. The need for and scope of any required monitoring is evolving as part of the iterative design process. In accordance with the EIA Regulations, the ES will identify the need for any monitoring required to monitor significant adverse environmental effects of the Proposed Development on the environment and/or to monitor the effectiveness of identified mitigation measures where considered appropriate. Any monitoring proposed at this PEIR stage with

respect to predicted likely significant adverse environmental effects is identified within the respective environmental factor chapters (**Chapters 5-13**). Monitoring measures will be secured through the DCO process to ensure that all measures are delivered as part of the Proposed Development.

Difficulties and uncertainties

4.6.32. Factor-specific difficulties and uncertainties are set out in **Chapters 5-13** of this PEIR. The following key general difficulties and uncertainties apply to a number of factor assessments:

- The detailed design of the Proposed Development is still developing, as are the environmental surveys and assessments required to support the planning and EIA process. This PEIR is prepared based on the preliminary information available at the time of writing. Each environmental factor chapter clearly sets out the additional work, including any surveys, that are required to inform the ES.
- The preliminary information presented in this PEIR is based on construction information available at the time of writing and based on reasonable worst case assumptions, where this data is not available.
- As the location and area of the components that the Proposed Development comprises are not yet defined or fixed, there is potential for uncertainty regarding the scope of assessment for each factor. However, the description of the Proposed Development presented in **Chapter 2** of this PEIR details the maximum parameters of the Proposed Development components as they are currently known. The preliminary assessment within this PEIR is based on a reasonable 'worst case scenario' based on the maximum parameters presented. In addition, **Table 4.3** in this chapter sets out the scenarios assessed in terms of optionality. This is the scenario that has been assessed within this PEIR (unless otherwise stated within the environmental factor chapters) and therefore whichever location or footprint is decided and applied, this preliminary assessment will ensure that the maximum level of significant environmental effects is considered. Further detail is provided in **paragraphs 4.6.4 – 4.6.5** and in **Chapters 5-13**.
- Data from third parties relied upon for the baseline against which any effects will be assessed could potentially be out of date or inaccurate. However, any such data will be sourced and secured from reputable and industry standard sources. It will be reviewed and used by competent and experienced professional experts. The combination of appropriate data

sources being used by competent and experienced experts will ensure that the data is suitable for its purpose, and will therefore provide an appropriate evidence base from which the existing environmental baseline will be informed.

5. Air Quality

5.1. Introduction

5.1.1. This chapter presents the preliminary environmental information and a preliminary assessment of the likely significant environmental effects arising from the construction and decommissioning of the Proposed Development upon air quality.

5.1.2. As proposed in the EIA Scoping Report and agreed through the Scoping Opinion received, impacts during operation (including maintenance) have not been considered within this preliminary environmental assessment. Refer to **Section 5.2** below for further detail.

5.1.3. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR) with particular reference to the following appendices in **Volume 3**:

- **Appendix 5.1** – Air Quality Method Statement; and
- **Appendix 5.2** – Response on Air Quality Method Statement.

5.2. Consultation, scope and study area

Consultation undertaken to date

5.2.1. An EIA Scoping Report, as provided in **Appendix 4.1**, setting out the proposed air quality 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 air quality in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

5.2.2. A method statement, as provided in **Appendix 5.1**, detailing the proposed air quality assessment scope and methodology (as presented in the EIA Scoping Report) was submitted to North Kesteven District Council and Lincolnshire County Council to seek their agreement on the proposed approach to the air quality assessment. A qualitative assessment based on the Institute of Air Quality Management's (IAQM) 'Guidance of the Assessment of Dust from Demolition and Construction' (IAQM, 2023)[38] to assess the potential dust impacts during construction and decommissioning, and a screening level qualitative assessment with reference to the Environmental Protection UK (EPUK) and

[38] Guidance of the Assessment of dust from demolition and construction (2023). Available online: [redacted]

IAQM 'Land-Use Planning and Development Control: Planning for Air Quality' (2017)[39] to assess the potential impacts of traffic exhaust emissions during construction and decommissioning, have been proposed in the method statement. Given the nature of the Proposed Development, an operational phase assessment has been proposed to be scoped out of further assessment. An email response, as provided in **Appendix 5.2**, was received from North Kesteven District Council on behalf of North Kesteven District Council and Lincolnshire County Council in August 2023, stating acceptance of the suggested assessment approach.

Scope of the assessment

5.2.3. 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.

5.2.4. A qualitative screening level assessment of the construction and decommissioning phase traffic impacts has been carried out as part of this preliminary assessment, with reference to the 2017 EPUK-IAQM guidance.

5.2.5. Details of the construction and decommissioning phase activities, including the scale of the anticipated works and plant and equipment to be used are not available at this preliminary assessment stage. Assessment of the dust emissions arising from construction and decommissioning activities will be conducted with reference to the IAQM 2023 guidance and reported in the ES. This preliminary assessment, however, provides commentary on predicted effects for these elements.

Receptors/matters scoped out of further assessment

5.2.6. **Table 5.1** presents the 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.

[39] Land-use Planning & Development Control: Planning for Air Quality (2017). Available online: [redacted]

Table 5.1 Receptor/matters scoped out of further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Dust and particulate matter emission resulting from the Site activities (operation of the Proposed Development and maintenance activities) and road traffic exhaust emissions during operation	Operation	Given the nature of the Proposed Development, no site activities resulting in significant emissions to air quality are anticipated during operation, and there will only be limited movement of vehicles to the Site for maintenance.	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.
Dust and particulate matter emissions resulting from demolition works	Construction	There are no demolition works proposed during the construction phase.	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.

Receptors/matters scoped into further assessment

5.2.7. **Table 5.2** presents the 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 5.2 Receptor/matters scoped into further assessment

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Dust and particulate matter emissions resulting from the	Construction and decommissioning	Impacts on sensitive receptors that are located up to 250m from the Site will be	No change – this matter was proposed to be scoped into further assessment

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Site activities (demolition (during decommissioning phase only), earthworks, construction and trackout), including the operation of the construction equipment		assessed. A qualitative, desk-based assessment of the site activities (earthworks, construction and trackout) is proposed to identify the type of mitigation required. The operation of the site equipment and machinery during construction will also result in emissions to the atmosphere of exhaust gases. A qualitative, desk-based assessment is proposed to identify the type of mitigation required.	within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Traffic exhaust emissions (including emissions haulage/construction vehicles and vehicles used for workers' trips to and from the Site)	Construction and decommissioning	A screening level qualitative assessment is proposed. The geographical extent of the study area is determined by the receptors close to roads predicted by the traffic assessment as likely to experience a significant change in traffic flows.	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

5.2.8. Based on the IAQM 2023 guidance, the study area for the construction and decommissioning phase assessments for sensitive human receptors for earthworks and general construction

activities is up to 250m from the Site boundary. For trackout[40] activities, the study area is up to 50m from the edge of the roads likely to be affected by trackout. The study area for sensitive ecological receptors for earthworks and general construction activities is up to 50m from the Site boundary.

5.2.9. The study area for the assessment of traffic exhaust emissions is determined by the receptors close to roads predicted by the traffic assessment as likely to experience a significant change in traffic flows, which comprises B1202, B1188, B1191, A15 and a small number of local minor roads (refer to **Chapter 12: Traffic and Transport** for further details).

5.3. Legislative framework, planning policy and guidance

Relevant legislation

5.3.1. Legislation relevant to the assessment of air quality comprises the following:

- The Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007 (Volume 1) (Volume 2);
- The Clean Air Strategy 2019;
- Directive 2008/50/EC of the European Parliament and of the Council of 21st May 2008 on Ambient Air Quality and Cleaner Air for Europe;
- Air Quality (England) Regulations 2000;
- Air Quality (England) (Amendment) Regulations 2022;
- Air Quality Standards Regulations 2010;
- Air Quality Standards (Amendment) Regulations 2016;
- The Environment Act 1995;
- The Environment Act 2021; and
- The Environmental Targets (Fine Particulate Matter) (England) Regulations 2023.

Relevant Planning Policy

5.3.2. Planning Policy relevant to air quality comprises the following:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)[41] provides the basis for decisions regarding

[40] Trackout is defined as the transport of dust and dirt from the construction/demolition sites onto public road network, where it may be deposited and then re-suspended by vehicles using the network.

[41] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure

nationally significant energy infrastructure. Section 5.2 outlines the planning policy for air quality, including guidance on undertaking relevant parts of the EIA.

- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[42] - Section 5.2 outlines the planning policy for air quality, including guidance on undertaking relevant parts of the EIA.
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[43] sets out the policies relating to electricity generation from renewable sources of energy. However, solar farms are not explicitly included within the document.
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[44] - Section 3.10 gives specific consideration to solar development including assessment of traffic and transport impacts.
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2011)[45] does not contain requirements relevant to air quality assessment.
- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023)[46]. The Draft NPS EN-5 does not introduce any new content with regards to air and solar energy developments.
- National Planning Policy Framework (NPPF) (September 2023)[47]; and
- Central Lincolnshire Joint Strategic Planning Committee, Central Lincolnshire Local Plan (2023)[48] including the following policies related to air quality:
  - Policy S14: Renewable Energy; and
  - Policy S53: Design and Amenity.

[42] 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
[43] National Policy Statement for Renewable Energy (EN-3) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[44] 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
[45] National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011). Available online: 1942-national-policy-statement-electricity-networks.pdf (publishing.service.gov.uk)
[46] Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023). Available online: EN-5 Electricity Networks National Policy Statement (publishing.service.gov.uk)
[47] National Planning Policy Framework (2023). Available online: https://www.gov.uk/government/publications/national-planning-policy-framework--2
[48] Central Lincolnshire Local Plan (2023). Available online: https://www.n-kesteven.gov.uk/central-lincolnshire/adopted-local-plan-2023

Applicable guidance

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

- IAQM, Guidance of the Assessment of Dust from Demolition and Construction, v2.1, 2023;
- EPUK and IAQM, Land-Use Planning and Development Control: Planning for Air Quality, 2017; and
- Department for Environment, Food and Rural Affairs (Defra), Local Air Quality Management (LAQM) Technical Guidance (TG.22), 2022.

5.4. Methodology

Data sources to inform baseline characterisation

5.4.1. A desk-based baseline air quality review has been undertaken to establish existing air quality conditions within the study area. Information on air quality has been gathered from the following sources:

- Air Quality Annual Status Report (ASR) published by North Kesteven District Council;
- Magic Map available online by Defra; and
- Estimated background air quality data from background maps published by Defra.

Surveys to inform baseline characterisation

5.4.2. Latest local air quality monitoring data is publicly available and therefore, no on-site air quality monitoring, survey or site visits have been undertaken to inform the baseline characterisation at this stage.

Design assumptions

5.4.3. **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.

5.4.4. **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.

5.4.5. The preliminary design principles and preliminary parameter plans set out the reasonable 'worst case scenario' that has been assessed within this chapter.

Embedded mitigation measures

5.4.6. 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. 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 air quality assessment comprise the following:

- There will be a minimum 20m offset from the Proposed Development to locally designated wildlife sites.
- Existing woodlands and tree belts will be retained as far as reasonably practicable, whilst noting that it is possible that individual trees may need to be removed to facilitate construction. There will be a minimum 15m offset from built development to existing woodland.
- There will be a minimum 250m offset of central inverters from residential properties.

Assessment methodology

5.4.7. The principal pollutants relevant to this preliminary assessment are considered to be Nitrogen Dioxide (NO_2) and Particulate Matter (PM_{10} and $PM_{2.5}$), generally regarded as the most significant air pollutants released by vehicular combustion processes, or subsequently generated by vehicle emissions in the atmosphere through chemical reactions.

5.4.8. For this preliminary assessment, the potential effects of construction traffic impacts on air quality as a result of the Proposed Development are reported based a on screening level qualitative assessment, together with initial consideration of whether the effect is likely to be significant or not.

5.4.9. Details of the decommissioning phase are not fixed at this stage. However, it is expected that the decommissioning phase will be

similar in nature to construction, albeit of a slightly shorter duration, with fewer road traffic movements and onsite equipment. The decommissioning phase is therefore less likely to cause an impact than the construction phase. As such, the construction phase is considered to be a worst-case proxy for the decommissioning phase.

5.4.10. At this preliminary assessment stage, detailed construction and decommissioning activities and plant lists have not been defined, and details to inform an assessment of dust emissions arising from construction and decommissioning activities are therefore not yet available to quantify impacts and their significance. A full assessment utilising significance criteria will be conducted and reported in the ES, based on the methodology presented in **Section 5.10**. However, this preliminary assessment does provide commentary on predicted effects for these elements.

Traffic exhaust emissions - construction and decommissioning phases

5.4.11. A screening level qualitative assessment for traffic exhaust emissions (construction phase only) has been undertaken as part of this preliminary assessment with reference to the 2017 EPUK-IAQM guidance, using professional judgement and by considering the following information which will form part of the final design of the Proposed Development, where available:

- The number of road traffic likely to be generated;
- The number and proximity of sensitive receptors to the Site and along the likely routes to be used by construction vehicles; and
- The likely duration and the nature of the construction/decommissioning activities undertaken.

5.4.12. **Table 5.3** below presents the 2017 EPUK-IAQM guidance screening criteria that is used for the preliminary assessment of construction phase traffic exhaust emissions.

Table 5.3 Indicative criteria for requiring an air quality assessment

The Development will	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic slows on local roads with relevant receptors	A change of LDV flows of: -more than 100 Annual Average Daily Traffic (AADT) within or adjacent to an Air Quality Management Areas (AQMAs) more than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors	A Change of HDV flows of: -more than 25 AADT within or adjacent to an AQMA -more than 100AADT elsewhere.

5.4.13. Initial construction phase AADT data (two-way trips) has been provided by the project transport consultant assuming a 2026 construction year, as 2026 represents a reasonable worst-case year of assessment as traffic growth increases year on year and any percentage impacts would therefore reduce beyond 2026. Construction phase traffic data is provided in **Table 5.4** below.

Table 5.4 Construction Phase Traffic Data

Link	2026 Construction Traffic associated with the Proposed Development	
	All vehicles	HGVs
A15 (north of B1191)	640	80
A15 (south of B1191)	640	80
B1191 (between RAF Digby and Ashby de la Launde)	880	80
B1191 (between Scopwick and RAF Digby)	880	80
B1188 (north of Scopwick)	640	80
B1188 (south of Digby)	640	80
A15 (south of Metheringham Heath Lane)	640	80
A15 (north of Leadingham)	640	80
B1188 (south of Scopwick)	640	80
A153 (directly north of junction with A17)	640	80
A17 (between A15 and A153)	640	80

5.4.14. For the purposes of this preliminary assessment, the decommissioning year is assumed to be 40 years from opening. As advised by the project transport consultant, this is considered to be too far into the future to be able to accurately predict traffic flows at that time. Therefore, it is considered reasonable to assume that traffic impacts during the decommissioning phase will be the same as or not greater than the construction phase.

5.5. Summary of baseline conditions

5.5.1. The Proposed Development is located within the administrative area of North Kesteven District Council. There are currently no AQMAs declared within the district.

5.5.2. According to the North Kesteven District Council 2022 Air Quality Annual Status Report (ASR), North Kesteven District Council undertook non-automatic NO_2 diffusion tube monitoring at 22

locations during 2021. There was no automatic air quality monitoring station within North Kesteven District Council area in 2021, and therefore PM_{10} and $PM_{2.5}$ monitoring data is not available. The nearest monitoring location to the study area is a roadside NO_2 diffusion tube location (North Kesteven District Council ref: Ruskington) situated approximately 4.3km away from the Site. The measured annual average NO_2 concentrations at this diffusion tube site, for years 2017 - 2021, ranged between 10.6µg/m^3 and 14.7µg/m^3, well below the annual mean NO_2 Air Quality Objective of 40µg/m^3.

5.5.3. Estimated background air quality data is available from the UK-AIR website operated by Defra. The website provides estimated annual average background concentrations of NO_2, PM_{10} and $PM_{2.5}$ on a 1km^2 grid basis from LAQM background maps. It is noted that estimated 2022 annual average background NO_2, PM_{10} and $PM_{2.5}$ concentrations at the Site are well below the relevant Air Quality Objectives (NO_2: 40µg/m^3, PM_{10}: 40µg/m^3, $PM_{2.5}$: 20µg/m^3). Overall, air quality is considered to be good in the local area.

Sensitive receptors

5.5.4. For the purpose of this preliminary assessment, human receptors have been identified within 250m of the Site, comprising:

- the village of Ashby de la Launde;
- the village of Scopwick; and
- the village of Blankney and RAF Digby.

5.5.5. Further detail on sensitive human receptors will be provided as part of the full assessment to be reported in the ES.

5.5.6. No designated ecological receptors (ancient woodlands, Local Nature Reserves (LNRs), National Nature Reserves (NNRs), Ramsar sites, Sites of Special Scientific Interest (SSSIs), Special Areas of Conservation (SAC), Special Protection Areas (SPAs)) have been identified within 50m of the Site.

5.5.7. Non-statutory designated sites (Local Wildlife Sites (LWS)) have been identified within or adjacent to the Site, comprising:

- Blankney Brick Pit LWS;
- Temple Road Verges, Welbourn to Brauncewell 2 LWS;
- A15, Slate House Farm to Dunsby Pit Plantation 1 LWS;
- A15, Green Man Road to Cuckoo Lane 2 LWS;
- Bloxholm Wood LWS/Lincolnshire Wildlife Trust reserve;
- Gorse Hill Lane LWS;
- Gorse Lane LWS; and

- Navenby Heath Road Verges LWS.

Future baseline

5.5.8. **Table 5.5** presents the estimated annual average NO_2, PM_{10} and $PM_{2.5}$ background concentrations from the latest 2018 background concentrations map published by Defra for the grid square containing the Proposed Development for years 2023 (current year), 2026 (the proposed construction commencement year) and 2030 (the proposed operation year). In terms of the construction period, which is anticipated to be up to 48 months between 2026 and 2029, the worst-case year for estimated annual average pollutant concentrations is predicted to be 2026. Therefore, the estimated annual average pollutant concentrations for 2027, 2028 and 2029 have not been reported or considered in this preliminary assessment.

5.5.9. No exceedances of the annual average NO_2, PM_{10} or $PM_{2.5}$ Air Quality Standards (AQSs) are predicted for years 2023, 2026 and 2030. Background concentrations are in general predicted to fall with time, because of the reduction in emissions to air resulting from newer technology vehicles (for example, improved engine performance, electric vehicles and improvement in fuel quality). Therefore, background concentrations in future years are not expected to exceed their respective annual mean standards.

5.5.10. Air quality across the study area in the absence of the Proposed Development is anticipated to remain largely unchanged from the levels in the current baseline conditions.

Table 5.5 Defra LAQM estimated background annual average NO_2, PM_{10} and $PM_{2.5}$ concentrations at the Site (from 2018 base map))

Assessment year	Estimated Annual Average pollutant concentrations derived from the LAQM support website		
	Annual average NO_2 ($\mu g/m^3$)	Annual average PM_{10} ($\mu g/m^3$)	Annual average $PM_{2.5}$ ($\mu g/m^3$)
2023 (current year (baseline))	6.74	15.25	8.15
2026 (proposed construction commencement)	6.18	14.95	7.91
2030 (proposed operation year)	5.90	14.89	7.87
Air Quality Standard (AQS)	40	40	20

Note: Presented concentrations for 1km^2 grid centred on 506500, 356500; approximate centre of the Site is 506382, 356551.

5.6. Likely effects, additional mitigation and residual effects

5.6.1. **Table 5.6** presents a summary of the predicted likely effects of the Proposed Development, additional mitigation and residual effects during construction and decommissioning.

Construction and Decommissioning phases

Table 5.6 Assessment of predicted likely effects, additional mitigation and residual effects during construction and decommissioning

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Dust and particulate matter emissions resulting from the Site activities (demolition (during decommissioning phase only), earthworks, construction and trackout), including the operation of the construction equipment during construction and decommissioning phases	Likely effects	Construction and decommissioning works have the potential to release dust including fine particulate matter, and impact on nearby sensitive human and ecological receptors (i.e., LWS). Appropriate dust control measures can be highly effective for controlling emissions from potentially dust generating activities, and adverse effects can be greatly reduced or eliminated. The operation of site construction equipment and machinery will result in emissions to atmosphere of exhaust gases. Embedded mitigation as listed in **Section 5.4** above has already been included in the design.
	Additional (secondary and tertiary) mitigation	Construction phase site-specific dust mitigation measures will be based on the results of pre-mitigation dust impacts assessment (to be presented in the ES), which will also be applied for the decommissioning phase where relevant. General measures for different aspects such as construction site management, site monitoring and operating machinery will be proposed. Mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan and the Outline Decommissioning Environmental Management Plan.
	Likely residual effects	The effect of dust and particulate matter emissions and exhaust emissions from construction equipment and machinery during the construction phase is likely to be

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		not significant, provided that dust controls, site management and dust mitigation measures are applied. Any effects on air quality during decommissioning will be temporary. The additional mitigation measures implemented during the construction phase will be also relevant for decommissioning phase and will be documented within and secured by the Outline Decommissioning Environmental Management Plan. With the implementation of the proposed additional mitigation measures, the residual effect during decommissioning is considered to be **not significant**.
Traffic exhaust emissions	Likely effects	Construction and decommissioning traffic will comprise haulage/construction vehicles and vehicles used for workers' trips to and from the Site. The greatest impact on air quality due to emissions from construction and decommissioning phase vehicles will be in areas adjacent to the Site access and nearby road network. Initial construction traffic data provided by the project transport consultant, suggests that the Proposed Development will not generate HDVs flows exceeding the 2017 EPUK-IAQM guidance screening criteria (i.e., a change of HGVs of more than 100 AADT). The predicted LDVs generation marginally exceeds the 2017 EPUK-IAQM screening criteria (i.e., a change of LGVs of more than 500 AADT), but this does not necessarily suggest that a significant impact is likely. The 2017 EPUK-IAQM guidance notes that '*the criteria provided are precautionary and should be treated as indicative. They are intended to function as a sensitive 'trigger' for initiating an assessment in cases where there is a possibility of significant effects arising on local air quality. This possibility will, self-evidently, not be realised in many cases*'. The traffic effects during construction will be limited to a relatively short period at each

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		section/phase of the Proposed Development and will be along traffic routes employed by haulage/construction vehicles and workers. Baseline air quality is likely to be good and the annual mean NO_2 concentration at the Site is expected to be well below the objective. Therefore, it is considered highly unlikely that the additional traffic emissions as a result of the Proposed Development will cause a significant adverse impact on local air quality. Details of the decommissioning phase are not fixed at this stage, it is expected that the decommissioning phase will be similar in nature to construction, albeit of a slightly shorter duration, with fewer road traffic movements. As advised by the project transport consultant, it is considered reasonable to assume that traffic impacts during the decommissioning phase will be the same as or fewer than the construction phase. Based on the temporary nature of the decommissioning activities and low background pollutant concentrations in the vicinity of the Site, it is considered that traffic exhaust emission during decommissioning phase will not result in a significant adverse effect on air quality.
	Additional (secondary and tertiary) mitigation	Any effects from traffic emissions on air quality will be temporary and can be suitably controlled by the employment of mitigation measures appropriate to the Proposed Development, which will be documented within and secured by the Outline Construction Traffic Management Plan (which will ultimately include a Construction Logistics Plan), the Outline Construction Environmental Management Plan and the Outline Decommissioning Environmental Management Plan. Potential mitigation could include junction and crossing improvements. The route of construction traffic will be documented within the Outline Construction Traffic Management Plan to be submitted in

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		support of the DCO application (refer to **Chapter 12: Traffic and Transport** for further detail), including details and controls of roads crossings by HGVs and minimising use of sensitive routes by HGVs.
	Likely residual effects	With mitigation measures in place, which will be documented within and secured by the Outline Construction Traffic Management Plan (which will ultimately include a Construction Logistics Plan), the Outline Construction Environmental Management Plan and the Outline Decommissioning Environmental Management Plan, the effect of traffic exhaust emissions during construction and decommissioning phases is predicted to be **not significant**.

5.7. Opportunities for environmental enhancement

5.7.1. The Proposed Development is based on a clean energy source. At the time of writing, there are limited opportunities for environmental enhancement specifically related to air quality associated with the Proposed Development.

5.8. Intra-project combined effects

5.8.1. It is recognised that there is the potential for the interaction and combination of residual effects identified in other environmental chapters of this PEIR to affect certain receptors discussed in this preliminary air quality assessment. This could include, for example, effects on human receptors arising from air quality (dust), visual and noise impacts. The intra-project combined effects will be presented within the ES once relevant assessments are further progressed.

5.8.2. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

5.9. Difficulties and uncertainties

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

5.9.2. The initial traffic data provided by the project transport consultant are based on worst case estimates at this stage. The traffic data will be updated in the ES based on the refined design of the Proposed Development.

5.9.3. Details of plant/equipment during the construction and decommissioning phases have not been defined. The plant selection and programme are expected to be defined during the preparation of the ES, as further information becomes available.

5.10. Further work to inform the ES

5.10.1. An assessment of the likely significant effects of construction and decommissioning phases dust[49] and particulate matter[50] at sensitive receptors will be undertaken following the IAQM 2023 guidance, using the available information for these phases of the Proposed Development provided by the project team and professional judgement.

5.10.2. The IAQM 2023 guidance makes reference to the use of professional judgement when assessing the risks of dust impacts from construction and decommissioning activities. Owing to this, professional judgement will be used when determining whether a risk is considered to be significant or not for the purpose of the construction and decommissioning phase assessment.

5.10.3. The assessment will consider the risk of potential dust and particulate matter effects from the following three sources: earthworks, general construction activities and trackout. It will take into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to increases in dust and particulate matter levels to assign a level of risk. **Table 5.7** and **Table 5.8** below indicate the scale of impact magnitude and the receptor sensitivity respectively that will be used in undertaking the construction and decommissioning phase assessment. Dust risks will be described in terms of low, medium or high as shown in **Table 5.9**. Once the level of risk has been ascertained, the site-specific mitigation proportionate to the level of risk will be identified. The assessment determines the significance of any residual effects once the pre-additional mitigation effects have been determined and appropriate additional mitigation measures have been identified.

Table 5.7 Scale of magnitude for dust emission impacts (from IAQM 2023 Guidance)

Activity	Magnitude	Description
Earthworks	Large	Total site area >110,000m^2, potentially dusty soil type (e.g., clay), >10 heavy earth moving vehicles active at any one time, formation of bunds >6m in height.
	Medium	Total site area 18,000 – 110,000m^2, moderately dusty soil type (e.g., silt), 5 – 10 heavy earth moving

[49] Dust refers to all airborne particulate matter (and is synonymous with the definition of TSP).
[50] Particulate matter refers to particles suspended in ambient air.

Activity	Magnitude	Description
		vehicles active at any one time, formation of bunds 4 – 6m in height.
	Small	Total site area <18,000m^2, soil type with large grain size (e.g., sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4m in height.
Construction	Large	Total building volume >75,000m^3, on site concrete batching, sandblasting.
	Medium	Total building volume 12,000 – 75,000m^3, potentially dusty construction material (e.g., concrete), piling, on site concrete batching.
	Small	Total building volume <12,000m^3, construction material with low potential for dust release (e.g., metal cladding or timber).
Trackout	Large	>50 HDV (>3.5t) trips in any one day, potentially dusty surface material (e.g., high clay content), unpaved road length >100m.
	Medium	20 – 50 HDV (>3.5t) trips in any one day, moderately dusty surface material (e.g., high clay content), unpaved road length 50 – 100m.
	Small	<20 HDV (>3.5t) trips in any one day, surface material with low potential for dust release, unpaved road length <50m.

Table 5.8 Scale of receptor sensitivity (from IAQM 2023 Guidance)

Sensitivity of area	Dust soiling	Human receptors	Ecological receptors
High	Users can reasonably expect an enjoyment of a high level of amenity. The appearance, aesthetics or value of their property would be diminished by soiling. The people or property would reasonably be expected to be	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day)	Locations with an international or national designation and the designated features may be affected by dust soiling. Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List For Great Britain. Examples include a Special Area of

Sensitivity of area	Dust soiling	Human receptors	Ecological receptors
	present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land. Examples include dwellings, museums and other culturally important collections, medium and long term car parks and car showrooms.	Examples include residential properties, hospitals, schools and residential care homes should also be considered as having equal sensitivity to residential areas for the purposes of this preliminary assessment.	Conservation (SAC) designated for acid heathlands or a local site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	Users would expect to enjoy a reasonable level of amenity, but would not reasonably expect to enjoy the same level of amenity as in their home. The appearance, aesthetics or value of their property could be diminished by soiling. The people or property wouldn't reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples include parks and places of work.	Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM_{10} (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Examples include office and shop workers, but will generally not include workers occupationally exposed to PM_{10}, as protection is covered by Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition. Example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.

Sensitivity of area	Dust soiling	Human receptors	Ecological receptors
Low	The enjoyment of amenity would not reasonably be expected. Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling. There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.	Locations where human exposure is transient. Indicative examples include public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. Example is a local Nature Reserve with dust sensitive features.

Table 5.9 Level of effects for dust emission impacts (from IAQM 2023 Guidance)

Sensitivity of area		Dust emission magnitude		
		Large	Medium	Small
Earthworks	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Construction	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk

Sensitivity of area		Dust emission magnitude		
		Large	Medium	Small
	Low	Low Risk	Low Risk	Negligible
Trackout	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Low Risk	Negligible
	Low	Low Risk	Low Risk	Negligible

5.10.4. Full assessments of the dust emissions arising from construction and decommissioning activities will be conducted with reference to the IAQM 2023 guidance to inform the ES.

6. Biodiversity

6.1. Introduction

6.1.1. 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 biodiversity.

6.1.2. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR) with particular reference to the following appendices in **Volume 3**:

- **Appendix 6.1** - Preliminary Ecological Appraisal – Report 1
- **Appendix 6.2** - Preliminary Ecological Appraisal – Report 2 (land at Brauncewell)
- **Appendix 6.3** – Preliminary Ecological Appraisal – Report 3 (Grid Connection Corridor)
- **Appendix 6.4** - Breeding Bird survey report
- **Appendix 6.5** - Bat activity survey report

6.1.3. Figures referred to in this chapter can be found in **Volume 2**.

6.2. Consultation, scope and study area

Consultation undertaken to date

6.2.1. An EIA Scoping Report, as provided in **Appendix 4.1**, setting out the proposed biodiversity 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 biodiversity in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

6.2.2. **Table 6.1** provides a summary of the consultation meetings that have been undertaken in support of the preparation of this preliminary assessment, out with the EIA Scoping process.

Table 6.9 Summary of consultation undertaken

Consultee	Key matters raised	Actions in response to consultee comments
Lincolnshire Wildlife Trust	Teams call meetings on 16th February 2023 and also on 20th June 2023: Concerns	Discussed possibilities for a collaborative regional approach to mitigation with other solar

Consultee	Key matters raised	Actions in response to consultee comments
	about cumulative impacts particularly ground nesting birds, from other solar projects in the area. Positive comments on design and protection of Local Wildlife Sites and design of habitat corridors.	development proposals in Lincolnshire. Discussed the potential for access improvements adjacent to Bloxham Woods Local Wildlife Sites (LWS) and the connection of habitats across the Site. Further consultation to be scheduled once the design has progressed.
Natural England	Teams call meeting on 20th June: No further comment on scoping of surveys. Natural England did not think wintering bird surveys would be required, however they could not confirm agreement on this. Any advice on the scope and method of surveys and licensing, if required, should be requested by the Discretionary Advice Service (DAS).	A project account will be set up with Natural England's DAS to gain advice on the scope and method of surveys. Further consultation meetings are planned once further survey work has been completed and the biodiversity design is progressed.
North Kesteven District Council and Lincolnshire County Council	Consultation meetings with North Kesteven District Council and Lincolnshire County Council about ecology surveys and biodiversity design were held on 14th September 2023.	North Kesteven District Council and Lincolnshire County Council agreed with the revised assessment of receptors to be scoped in and those to be scoped out (as per the scope presented in **Table 6.2** and **Table 6.3** below) on the proviso that wintering bird surveys and notable arable (non-crop) plant surveys should be carried out to determine presence or likely absence. The number of wintering bird surveys could be curtailed if they are found to be likely absent.

Scope of the assessment

6.2.3. Scoping is an ongoing process – the scope of the ecological impact assessment may be modified following further ecological survey/research and during impact assessment[51].

6.2.4. 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

6.2.5. **Table 6.2** 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. The position from the Scoping Opinion is also referenced, where appropriate.

[51] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. The Chartered Institute of Ecology and Environmental Management's (version 1.2 updated April 2022).

Table 6.10 Receptor/matters scoped out of further assessment

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Statutory designated nature conservation sites	Construction, operation and decommissioning	There are no international nature conservation sites within 10km, nor any national statutory designated nature conservation sites within 2km of the Site, except Metheringham Heath SSSI, which is designated for geological interest and lies 1.9km from the Site. The only SSSI Impact Risk Zone, which covers a small part of the western edge of the Site, is for High Dyke SSSI (3.6km south west of the Site). Planning applications which are considered potentially of concern for air pollution are listed as: aviation, livestock and poultry units, slurry lagoons and digestate stores and manure stores. None of these relate to the Proposed Development. Therefore, all statutory sites have been scoped out due to distance from the Site, the nature of the Proposed Development and lack of any direct hydrological connection.	No change – these receptors were proposed to be scoped out to further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Four non-statutory LWS which lie within the Site boundary: Blankney Brick Pit LWS; A15 Temple Road Verges, Welbourn to Brauncewell LWS; A15, Slate House Farm to Dunsby Pit Plantation	Construction, operation and decommissioning	All these LWS sites are avoided by the Proposed Development design with a minimum offset distance of 20m from any built development so they should not be directly impacted by construction works or operational impacts. Indirect effects from construction will be mitigated by control measures, as documented within and secured by the Outline Construction Environmental Management Plan. The Outline Landscape and	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report, but the Scoping Opinion has requested they be scoped in. However, the Applicant is of the

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
LWS; and A15, Green Man Road to Cuckoo Lane LWS		Ecological Management Plan will document and secure measures to enhance the LWS, where appropriate. The Scoping Opinion stated that as no site layout plan was available at the scoping stage, it could not be confirmed that impacts would be avoided. However, the design has now progressed, and the Zonal Masterplan in **Figure 2-3** shows the offset from LWSs (shown in **Figure 6-1**).	opinion that these receptors should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Three LWS within or immediately adjacent to the Site: Navenby Heath Road Verges LWS; Gorse Hill Lane LWS; and Gorse Land LWS	Operation	Navenby Heath Road Verges LWS, Gorse Hill Lane LWS and Gorse Lane LWS are grassland verges bordering road or farm tracks (designated for calcareous grassland) within or immediately adjacent to the Site. These sites, like all other LWS within the Site, will be retained. It is not anticipated that these LWS will be affected during the operational phase as the solar farm is a passive development and any operational works will be small scale and localised. No works traffic will use the tracks through these LWS. However, these three sites have been scoped into further assessment with regards to the construction and decommissioning phases (shown in **Table 6.3** below) as it is not yet known what distance of works buffer can be maintained. Further design work will confirm the distance of the buffer to be implemented.	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report, but the Scoping Opinion has requested they be scoped in. However, the Applicant is of the opinion that these receptors should remain scoped out of further assessment for the operational phase for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
One LWS immediately adjacent to the Site: Bloxholm Wood LWS	Construction, operation and decommissioning	Bloxham Wood LWS is adjacent to the Site. It will be protected by 20m buffer zone from built development and will be protected from indirect impacts during construction works by control measures documented within and secured by the Outline Construction Environmental Management Plan. As per above, it is not anticipated that this LWS will be affected during the operational phase. The Scoping Opinion stated that as no site layout plan was available at the scoping stage, it could not be confirmed that impacts would be avoided. However, a Zonal Masterplan is provided in **Figure 2-3** to show the offset from LWSs (shown in **Figure 6-1**).	No change – this receptor 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 receptor should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
One ancient woodland (Long Wood) and 17 No. LWS within 2km of Site: Blankney Dyke 2 LWS; Long Wood LWS; Blankney LWS; Blankney Dyke 1 LWS; Longwood Quarry, Blankney LWS; St John the Baptist Churchyard LWS; Temple Bruer LWS; Brauncewell	Construction, operation and decommissioning	There are 17 other LWS and one area of ancient woodland within a 2km radius of the Site boundary (details are provided in **Appendix 6.1** and **Appendix 6.2**). They have been scoped out due to the distance of these sites from the Site and a lack of relevant links or impact pathways. The Scoping Opinion stated that as no site layout plan was available at the scoping stage, it could not be confirmed that impacts would be avoided. However, a Zonal Masterplan is provided in **Figure 2-3** to show how they interact with the LWSs (shown in **Figure 6.1**).	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report, but the Scoping Opinion has requested they be scoped in. However, the Applicant is of the opinion that these receptors should remain

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Quarry LWS; Scopwick Heath Old Quarry LWS; Green Man Lane 3 LWS; Wellingore Heath Road Verges 2 LWS; Navenby, Green Man Road Verges LWS; High Dyke Long Lane to Navenby Verges LWS; Boothby Graffoe Road Verges LWS; Green Man Lane 2 LWS; Wellingore Heath Road Verges 1 LWS; Gorse Lane 2 LWS			scoped out of further assessment for the reasons outlined in the 'Justification' column.
Hedgerows and trees	Construction, operation and decommissioning	As detailed in **Chapter 4**, **Table 4.4**, there will be a minimum 10m offset from built development to all existing hedgerows and trees, where practicable. Control measures will be documented within and secured by the Outline Construction Environmental Management Plan and Outline Operational Environmental Management Plan to protect roots and branches during construction and operational works respectively. No veteran trees have been identified on Site. The Scoping Opinion stated that as no site layout plan was available at the scoping stage, it could not be	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report, but the Scoping Opinion has requested they be scoped in. However, the Applicant is of the opinion that these receptors should remain scoped out of further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		confirmed that impacts would be avoided. However, a Zonal Masterplan is provided in **Figure 2.3** which details the offset from field boundaries. Hedgerow re-planting and compensation for hedgerow or tree loss will be documented within and secured by the Outline Landscape and Ecological Management Plan.	assessment for the reasons outlined in the 'Justification' column.
Ponds	Construction, operation and decommissioning	No ponds will be lost as a result of the Proposed Development and suitable buffers will be maintained to safeguard ponds. Control measures will be documented within and secured by the Outline Construction Environmental Management Plan to prevent indirect impacts from construction such as air and water pollution. This will include any measures required to safeguard ponds from any impacts from battery storage areas. The Scoping Opinion stated that as no site layout plan was available at the scoping stage, it could not be confirmed that impacts would be avoided. However, the indicative green infrastructure parameters plan (**Figure 2.5**) shows the location of ponds, within the Site boundary, in areas which are to be retained for mitigation, enhancement and/or retained agricultural land and are all therefore outside of the indicative area of proposed Solar PV development.	No change – this receptor 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 receptor should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Good quality semi-improved grassland	Construction, operation and decommissioning	There was one area of good quality semi-improved grassland within the Site. A review of the information available on Magic[52] identified that it does not qualify as priority habitat Lowland Meadow (land parcel Bk17 near Scopwick); however, it had moderate species richness and was considered of Local importance. This grassland has been excluded from the area of Solar PV development. Note: this was changed from lowland meadow to semi-improved grassland. The Scoping Opinion stated that as no site layout plan was available at the scoping stage, it could not be confirmed that impacts would be avoided. However, an indicative green infrastructure parameters plan is now provided to show that this area will be avoided (**Figure 2.5**).	No change – this receptor 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 receptor should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Other semi-improved grassland	Construction, operation and decommissioning	There were four other areas of semi-improved grassland within the Site (shown in UKHab (habitat) plan in **Appendix 6.1** and **Appendix 6.2**). All the semi-improved grassland areas have been included in the biodiversity design for enhancement. Mitigation measures to protect the grassland will be documented within and secured by the Outline Construction Environmental Management Plan.	No change – this receptor 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 receptor

[52] Defra: 'Magic' interactive map. Website: Magic Map Application (defra.gov.uk)

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		The grassland was assessed during the PEA survey and all the semi-improved grassland is to be protected and enhanced as part of the biodiversity design.	should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Rare or notable arable (non-crop) plants	Operation	Rare or notable arable (non-crop) plant surveys are proposed to be carried out in 2024. If found to be present, they are not anticipated to be affected by the operation of the Proposed Development as field margins will be protected by buffer zones and land under the Solar PV modules or retained/enhanced (for ground nesting birds) will largely be managed as farmland similar to before development.	No change – this receptor 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 receptor should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Invasive species	Construction, operation and decommissioning	No invasive species were identified during PEA survey and have not been subsequently identified during further surveys. Notwithstanding, biosecurity measures will be documented within and secured by the Outline Construction Environmental Management Plan to avoid accidental introduction.	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		The Scoping Opinion agrees that invasive species can be scoped out if no invasive species are identified during further surveys.	Opinion has agreed with this approach.
Invertebrates	Construction, operation and decommissioning	Due to a lack of records of Schedule 5 species (protected under the Wildlife and Countryside Act 1981 (as amended)) and a lack of high-quality habitat within the Site that could support an important invertebrate assemblage. The Scoping Opinion states that invertebrates can be scoped out if it can be demonstrated that no protected species or high-quality habitat are observed following completion of all the surveys. The PEA surveys have all now been completed and no high-quality invertebrate habitat have been recorded.	No change – this receptor 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 receptor should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
European eel	Construction, operation and decommissioning	No ponds or watercourses will be lost as a result of the Proposed Development. If small sections of watercourses are affected, then mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan. The Scoping Opinion states that if there is potential for waterbodies to be affected, and due to the lack of detail regarding the proposed mitigation measures, this receptor could not be scoped out at this time. No direct	No change – this receptor 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

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		or indirect impacts on waterbodies are anticipated as mitigation measures, if required, will be implemented and discussed in the ES and documented within and secured by the Outline Construction Environmental Management Plan. Measures may include, for example, implementation of erosion and silt controls (e.g., silt traps) to prevent run-off sedimentation of watercourses.	opinion that this receptor should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Reptiles	Construction, operation and decommissioning	The four semi-improved grassland areas which were considered potentially suitable for reptiles will be excluded from development. The method of works to avoid harm to any low numbers of reptiles which may be present in field margins will be documented within and secured by the Outline Construction Environmental Management Plan. The Scoping Opinion considers that further reptile surveys should be undertaken in any of the areas of suitable habitat identified in the PEA. However, as the areas considered potentially suitable for reptiles will be excluded from the area of Solar PV development, no reptile surveys are proposed.	No change – this receptor 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 receptor should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Great crested newts (GCN)	Construction, operation and decommissioning	GCN are considered likely to be absent from the Site. There are no records of GCN within 2km of the Site boundary, and out of the 13 suitable ponds on Site which were eDNA analysed, 11 were negative and 2 were	Change - this receptor was proposed to be scoped into further assessment within the EIA Scoping Report, but

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		indeterminate (details of the surveys are presented in **Appendix 6.1** and **Appendix 6.2**). No ponds outside of the Site boundary have been surveyed. However, due to the lack of suitable mapped ponds within 50m of the Site, lack of GCN records within 2km and negative eDNA results of ponds on Site, it is considered that GCN are likely absent from the Site and no further surveys, or surveys of ponds outside of the Site boundary, are necessary. GCN were previously scoped in within the EIA Scoping Report as one pond near Brauncewell had not been eDNA surveyed at the time of scoping. This pond was surveyed in late April 2023 with negative results. All suitable ponds on Site have now been surveyed and there is no likely presence.	due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor is now scoped out of further assessment for the reasons outlined in the 'Justification' column.
Non-ground nesting birds	Construction, operation and decommissioning	In accordance with the project principles of the Proposed Development, boundary hedgerows and trees will be enhanced and 10m buffers from built development will sufficiently safeguard nests during construction, operation and decommissioning. No disturbance effects are anticipated during operation. The Scoping Opinion noted that no site layout plan was available at the scoping stage and no detail was provided regarding mitigation measures. However, mitigation will be documented within and secured by the Outline Construction Environmental Management Plan.	No change – this receptor 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 receptor should remain scoped out of further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			assessment for the reasons outlined in the 'Justification' column.
Wintering birds	Operation	The Scoping Opinion stated that as no specific wintering bird surveys have been carried out, the scoping out of wintering birds has not been evidenced. Following consultation with North Kesteven District Council and Lincolnshire County Council on 15th September 2023, it was agreed that wintering bird surveys will be carried out to determine presence or likely absence. If wintering birds are found to present, then they are not anticipated to be disturbed during operation as it is a passive development. Operational works are expected to be small scale and localised.	No change – this receptor 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 receptor should remain scoped out of further assessment for the operational phase for the reasons outlined in the 'Justification' column.
Barn owl	Construction, operation and decommissioning	Barn owl (two pairs) have been found to be nesting on Site. If nesting adjacent to works, they may be disturbed by construction and decommissioning works. However, this will be mitigated by buffer zones between the solar panels and boundary features. There is not anticipated to be loss of foraging habitat as boundary features and grass margins will be enhanced and other habitat creation and enhancement works will be documented	No change – this receptor 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,

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		within and secured by the Outline Landscape and Ecological Management Plan. Careful management of buffer zones plus habitat retained and enhanced (for ground nesting birds) should ensure sufficient hunting habitat for barn owls. Pre-construction and pre-decommissioning surveys will be carried out to ensure no nesting barn owls are disturbed by construction or decommissioning works. As construction is in daylight hours there should not be disturbance to hunting birds. The Scoping Opinion noted that no site layout plan was available at the scoping stage and no detail was provided regarding mitigation measures. However, there is not anticipated to be any significant effects from habitat loss, disturbance or lighting. Mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan.	the Applicant is of the opinion that this receptor should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Marsh harrier	Construction, operation and decommissioning	No marsh harrier were observed nesting on Site and they are considered unlikely to be using the Site for nesting. There is not anticipated to be a loss of foraging habitat as a result of the Proposed Development as marsh harriers mostly hunt along field margins which will be maintained and enhanced and documented within and secured by the Outline Landscape and Ecological Management Plan. The Scoping Opinion noted that no site layout plan was available at the scoping stage and no detail was	No change – this receptor 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 receptor

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		provided regarding mitigation measures. However, there is not anticipated to be any significant effects from habitat loss or disturbance (as shown in the Green Parameter plan **Figure 2-5**). Mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan.	should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Bats	Operation and decommissioning	There is not anticipated to be any significant effect on bats during operation or decommissioning. There will be no permanent lighting for the Proposed Development. Manually operated lighting would only be used infrequently in welfare or compound areas when needed to work during the hours of darkness or in an emergency. Lighting would be directed downwards and away from hedgerows, woodland and watercourses so bats which are sensitive to light would not be affected. The infrequency and short-term use of any lighting should also not cause significant loss of invertebrate prey from hedgerows (i.e., by being attracted to the light). A lighting scheme will be designed to reduce light spill and any effects to human and ecological receptors and secured through the DCO. Therefore, there is predicted to be no significant effect from lighting. The design objectives for biodiversity enhancement and buffer zones would ensure that woodlands, watercourses, hedgerows and trees will be protected	No change (for operation or decommissioning) – this receptor 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 receptor should remain scoped out of further assessment for the operational and decommissioning phases for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		from operational works traffic and any maintenance works. The effects of Solar PV development on foraging/commuting bats is still poorly understood. The presence of Solar PV modules could have an adverse effect on bats (as some species may be less inclined to forage over them[53]) and there is evidence that smooth surfaces may confuse bats by reflecting calls away from them, so these solid surfaces may not be detectable, causing collision[54]. However, other research undertaken has indicated that bats were able to quickly learn the difference between water and smooth surfaces in the wild and modify their behaviour[55]. Overall, the current, albeit limited, research indicates that although bats may confuse smooth flat surfaces with water bodies, it seems unlikely that this would have direct detrimental effects on bat populations and therefore the installation of Solar PV modules is not anticipated likely to significantly affect the conservation status of the local bat population. Operational works will be small scale and localised so should not cause disturbance.	

[53] Tinsley E., Froidevaux J. S. P., Zsebők S., Szabadi K. L., Jones G. (2023). Renewable energies and biodiversity: Impact of ground-mounted solar photovoltaic sites on bat activity. Journal of Applied Ecology. Published by John Wiley & Sons Ltd on behalf of British Ecological Society.
[54] Grief et al. (2017). Acoustic mirrors as sensory traps for bats. SCIENCE; 357(6355): 1045-1047
[55] Russo, D., Cistrone, L., and Jones, G. (2012) Sensory ecology of water detection by bats: a field experiment. PLoS ONE. 7(10): e48144

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Badger	Construction, operation and decommissioning	All known setts will be retained with an appropriate buffer to avoid disturbance or damage to setts. Field margins will remain as open corridors for animals to disperse and mammal gates are anticipated to be installed within the fences to allow badgers access into panel fields for foraging. As badgers are highly mobile, further surveys will be carried out prior to construction and decommissioning as required. Mitigation measures to ensure safeguarding badgers and their setts will be documented within and secured by the Outline Construction Environmental Management Plan.	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Brown hare, deer and hedgehogs	Construction, operation and decommissioning	Field margins will remain as open corridors for animals to disperse across the Site and small gaps will be created at the base of fences to allow hares and hedgehogs access into panel fields for foraging. The Scoping Opinion states that the ES should consider effects on these species and be supported by robust survey data, unless otherwise agreed with relevant consultation bodies. Mitigation measures to ensure there is no impact on dispersal and foraging for brown hare and hedgehogs will be documented within and secured by the Outline Construction Environmental Management Plan, the Outline Operational Environmental Management Plan and the Outline Decommissioning Environmental Management Plan respectively.	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.

Receptors/matters scoped into further assessment

6.2.6. **Table 6.3** 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. The position from the Scoping Opinion is also referenced where appropriate.

Table 6.11 Receptor/matters scoped into further assessment

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Three Local Wildlife Sites (LWS) within or immediately adjacent to the Site: Navenby Heath Road Verges LWS; Gorse Hill Lane LWS and Gorse Land LWS	Construction and decommissioning	Navenby Heath Road Verges LWS; Gorse Hill Lane LWS and Gorse Lane LWS are calcareous grassland road verges which lie within the Site or immediately adjacent to the Site boundary of Springwell West (locations shown in **Figure 6.1**). Based on the current design of the Proposed Development upon which this preliminary assessment is based, these sites have been scoped into further assessment due to their proximity to construction works which could directly impact upon them. The design and further mitigation measures to safeguard the LWS are under review and will be documented within and secured by the Outline Construction Environmental Management Plan.	Change - these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors are now scoped in.
Hedgerows and trees: Only those which may need to be permanently removed for internal access tracks	Construction	All other hedgerows and trees have been scoped out (see **Table 6.2** above). However, the hedgerows which have been scoped into further assessment are only those hedgerows which may need to be removed, during the construction phase, for internal access tracks (all potential access tracks are shown in **Figure 2.6**). The defined location of any new internal accesses and cabling locations have not yet been confirmed. It is anticipated that avoidance, mitigation or compensation will offset hedgerow removal effects.	Change - these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors are now scoped in.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Rare or notable arable (non-crop) plants	Construction and decommissioning	The Scoping Opinion stated that as no specific arable (non-crop) plant surveys have been carried out, the scoping out of arable (non-crop) plants has not been evidenced. Following consultation with North Kesteven District Council and Lincolnshire County Council on 15th September 2023, it was agreed that notable arable (non-crop) plant surveys will be carried out to determine presence or likely absence. If any rare or notable arable plants are identified, then suitable mitigation measures will be documented within and secured by the Outline Landscape and Ecological Management Plan.	Change – this receptor 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.
Ground nesting birds	Construction, operation and decommissioning	Construction and operation would cause loss of breeding habitat. Construction and decommissioning could also cause noise and visual disturbance, although mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan. Surveys have been carried out in 2023 and have identified a farmland bird assemblage including ground nesting species of some importance. This information will be used to inform the design and mitigation of the Proposed Development to provide continued open space for ground nesting birds and food supply during breeding periods. The biodiversity design and habitat creation and enhancement during the operational phase should enhance the Site for ground nesting birds.	No change – this receptor was proposed to be scoped into further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Wintering birds	Construction and decommissioning	The Scoping Opinion stated that as no specific wintering bird surveys have been carried out, the scoping out of wintering birds has not been evidenced. As stated previously (in **Table 6.1** and **Table 6.2** above), it has been agreed with North Kesteven District Council and Lincolnshire County Council that wintering bird surveys will be carried out to determine presence or likely absence. If wintering birds are present, construction would cause temporary loss of foraging habitat. Construction and decommissioning could also cause noise and visual disturbance. However, mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan and the Outline Decommissioning Environmental Management Plan.	Change – this receptor 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.
Bats	Construction	It was previously assumed that there would be no likely significant effect on bats during construction as it was assumed that hedgerows would not be significantly affected by the Proposed Development. However, a few sections of hedgerow may need to be cleared for access or be temporarily removed for underground cable installation. Therefore, at this stage, further assessment on bats usage of the Site and potential impacts from permanent hedgerow removal will be undertaken in the ES. The design has not yet confirmed which sections of hedgerow will need to be removed for internal access tracks. Hedgerow removal could disrupt bats foraging and commuting flight paths.	Change - this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report, but due to changes in the design of the Proposed Development since the EIA Scoping Report was submitted, this receptor is now scoped in.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		Roosting bats could be disturbed by construction activity. However, this will be mitigated by measures documented within and secured by the Outline Construction Environmental Management Plan, including retention of such features, and buffer zones from work areas. There is not anticipated to be any significant loss of foraging habitat as a result of the Proposed Development (and there is anticipated to be some benefits to foraging bats from proposals to enhance habitat for ground nesting birds).	
Water voles	Construction and decommissioning	It was previously assumed that no watercourses would be affected by construction of the Proposed Development. However, based on the current design of the Proposed Development upon which this preliminary assessment is based, there is now the possibility that watercourses may be affected due to the potential requirement for culverts/bridges across ditches and small watercourses. It is anticipated that any potential effects on watercourses would be localised and small scale. No ponds or watercourses will be lost as a result of the Proposed Development and a 10m and 6m works buffer will be implemented from main river and ditch banks respectively. However, it is possible that bridges may need to be installed over a limited number of watercourses to serve internal access tracks, which will lead to a breach of these buffers. Once the design of the Proposed Development has progressed and it is confirmed that some watercourses will be affected, then further survey and appropriate mitigation	Change - this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report, but due to changes in the design of the Proposed Development since the EIA Scoping Report was submitted, this receptor is now scoped in.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		measures will be implemented to ensure no significant effect on the conservation status of water voles. Pollution control measures for any works near watercourses will be documented within and secured by the Outline Construction Environmental Management Plan.	
Otter	Construction	As for water voles, discussed above. Once it is confirmed if any watercourses will be affected, then appropriate mitigation measures will be implemented to ensure no significant effect on the conservation status of otters.	Change - this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report, but due to changes in the design of the Proposed Development since the EIA Scoping Report was submitted, this receptor is now scoped in.

Extent of the study area

6.2.7. The survey/assessment study area includes the Site (as displayed in **Figure 2.2**) and appropriate buffer zones, which varies per receptor as discussed below:

- Background data searches for statutory and non-statutory designated sites and protected species records have focused on the Site and a 2km buffer, extended to 10km for Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. Therefore, this is considered to be the Zone of Influence.
- A Data Report from the British Trust for Ornithology (with records from 2019 to May 2023) was also included in the desk study with data spanning two 10km squares (which encompassed the entire Site, up to 10km north of the Site and up to 2km south of the Site). This is to allow placing breeding birds into a local and regional context.
- The survey study area for survey work is the entire Site. The exceptions being:
  - The survey study area for hedgerows and invasive species comprise all the proposed works areas within the Site and any of those where ancillary works will occur potentially outside of the Site boundary.
  - If any design updates to the Proposed Development determine that sections of watercourse will be impacted, e.g., culverted to allow for cable installation, then water vole and otter surveys will be carried out in, and adjacent to, the works area, for up to 100m upstream and downstream, where accessible. Adjacent waterbodies would be included to account for any effects that may extend beyond the Site boundary. Direct or indirect pathways and functionally linked effects for watercourses would also be considered.

6.3. Legislative framework, planning policy and guidance

Relevant legislation

6.3.1. The applicable legislative framework is summarised as follows (further details are provided in the PEA report, **Appendix 6.1** of **Volume 2**):

- The Birds Directive in relation to Natura 2000 sites[56] This relates to the conservation of all species of naturally

[56] Birds Directive, Available Online: https://www.legislation.gov.uk/eudr/2009/147

occurring birds in their wild state in the territory of the EU Member States to which the treaty applies;

- The Habitats Directive in relation to Natura 2000 sites[57].The Habitats Directive 1992 requires EU Member States to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of community interest, which are listed under Annex I, II, IV and/or V. Species listed under Annex IV are known as 'European Protected Species';
- The Conservation of Habitats and Species Regulations 2017 (as amended) and the Conservation of Habitats and Species (Amendment) (EU Exit) Regulations 2019[58];
- The Wildlife and Countryside Act 1981 (as amended)[59];
- The Countryside and Rights of Way Act 2000[60];
- The Environment Act 2021[61];
- The Natural Environment and Rural Communities Act (NERC) 2006[62];
- The Hedgerows Regulations 1997[63];
- The Protection of Badgers Act 1992[64];
- The Wild Mammals (Protection) Act 1996[65]; and
- The Invasive Alien Species (Enforcement and Permitting) Order 2019[66].

[57] Habitats Directive. Available Online: https://www.legislation.gov.uk/eudr/1992/43
[58] Conservation of Habitats and Species Regulations 2017. Available Online: https://www.legislation.gov.uk/uksi/2017/1012
[59] Wildlife and Countryside Act. Available Online: https://www.legislation.gov.uk/ukpga/1981/69;
[60] The Countryside and Rights of Way Act 2000. Available online: https://www.legislation.gov.uk/ukpga/2000/37
[61] The Environment Act. Available online: https://www.legislation.gov.uk/ukpga/2021/30/contents/enacted
[62] The Natural Environment and Rural Communities Act 2006. Available online: https://www.legislation.gov.uk/ukpga/2006/16
[63] The Hedgerow Regulations 1997. Available online: https://www.legislation.gov.uk/uksi/1997/1160/made
[64] The Protection of Badgers Act 1992. Available online: https://www.legislation.gov.uk/ukpga/1992/51
[65] The Wild Mammals (Protection) Act 1996. Available online: https://www.legislation.gov.uk/ukpga/1996/3
[66] The Invasive Alien Species (Enforcement and Permitting) Order 2019. Available online: https://www.legislation.gov.uk/uksi/2019/527/contents/made

Relevant planning policy

Table 6.4 Relevant planning policy

relevant planning policy	Policy clauses
Overarching National Policy Statement for Energy (NPS EN-1) (2011)[67] provides the basis for decisions regarding nationally significant energy infrastructure.	Section 5.3 refers to the impact on biodiversity and geological conservation.
Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[68]	Section 5.4 refers to the impact on biodiversity and geological conservation.
National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[69]	Section 2.5 states that consent for renewable energy projects should only be granted where it can be demonstrated that the objectives of designation of the area will not be compromised by the development, and any significant adverse effects on the qualities for which the area has been designated are clearly outweighed by the environmental, social and economic benefits.
Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[70]	Section 3.3 also makes reference to the need to consider whether the benefits of large-scale renewable projects would outweigh any loss or harm to the significance of a designated nature conservation site.
National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2011)[71]	Section 2.7 refers to biodiversity and consideration of overhead lines with particular consideration on feeding and hunting grounds, migration, migration corridors and breeding grounds.

[67] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: National Policy Statements for energy infrastructure - GOV.UK (www.gov.uk)
[68] Draft National Policy Statement for Energy (EN-1) (2023). Available online: Planning for new energy infrastructure: revisions to National Policy Statements - GOV.UK (www.gov.uk)
[69] National Policy Statement for Renewable Energy Infrastructure (EN-3) (2011). Available online: National Policy Statements for energy infrastructure - GOV.UK (www.gov.uk)
[70] Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) (2023). Available online: National Policy Statements for energy infrastructure - GOV.UK (www.gov.uk)
[71] National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011). Available online: 1942-national-policy-statement-electricity-networks.pdf (publishing.service.gov.uk)

relevant planning policy	Policy clauses
Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023)[72]	Section 2.5 makes reference to environmental and Biodiversity Net Gain opportunities to reconnect habitats and people in tandem with environmental enhancements.
National Planning Policy Framework (NPPF) (September 2023)[73]: The NPPF sets out the Government's planning policy in England at the national level. It does not contain specific policies for nationally significant infrastructure projects, which are determined in accordance with the decision-making framework in the Act and relevant National Policy Statements for major infrastructure, as well as any other matters that are relevant (which may include the NPPF).	Section 15 (paragraphs 174-188) of the NPPF specifies the requirements for conserving and enhancing the natural environment through the planning and development process to minimise impacts on habitats and biodiversity.
Government's 25-Year Environment Plan 2018[74] . This sets out how the UK Government intends to improve the natural health of the UK through improving land, air and water quality, as well as setting out how the effects of climate change will be tackled.	The plan sets out a number of policies that look at managing land sustainably, improving and enhancing landscapes and biodiversity for both marine and terrestrial environments, improving resource efficiency and reducing waste and pollution.
The Central Lincolnshire Local Plan 2018-2040[75] was adopted by the Central Lincolnshire Joint Strategic Planning Committee on 13 April 2023 and it now replaces the 2017 version of the Central Lincolnshire Local Plan as the development plan for the City of Lincoln, West Lindsey and North Kesteven District Councils.	Section 11: 'Natural Environment' makes reference to the opportunities and conservation of green and blue infrastructure; biodiversity and geodiversity (Policy S60 refers to protection of designated sites, habitats and species of Principal Importance); biodiversity net gain (Policy S61 refers to Biodiversity Opportunities and Delivering Measurable Net Gain); and trees,

[72] Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements
[73] National Planning Policy Framework (NPPF) 2023. Available online: https://www.gov.uk/government/publications/national-planning-policy-framework--2
[74] 25-Year Environment Plan. Available online: https://www.gov.uk/government/publications/25-year-environment-plan
[75] Adopted Local Plan 2023 | Central Lincolnshire Local Plan (n-kesteven.gov.uk)

relevant planning policy	Policy clauses
	woodlands and hedgerows (Policy S66 refers to conservation of trees, woodlands and hedgerows and mitigation).

Applicable guidance

6.3.2. The following guidance document has been used during the preparation of this preliminary assessment:

- The Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland, referred to here as 'the CIEEM Guidelines' (CIEEM, 2018; version 1.2 updated April 2022).

6.4. Methodology

Data sources to inform baseline characterisation

6.4.1. The preliminary assessment scope has been based on:

- A background data search was requested from Greater Lincolnshire Nature Partnership, which included a search for nationally designated sites (both statutory and non-statutory) and protected species records within 2km of the Site, extended to 10km for internationally protected SPAs, SACs and Ramsar sites.
- Data Report from the British Trust for Ornithology (with records from 2019 to May 2023) with data spanning two 10km squares (which encompassed the entire Site, up to 10km north of the Site and up to 2km south of the Site) to place breeding bird survey data into a local and regional context.

6.4.2. The assessment to be presented in the ES will be informed by further surveys undertaken in 2023/2024 (see **paragraph 6.4.8** below for further details).

Surveys to inform baseline characterisation

6.4.3. A Preliminary Ecological Appraisal (PEA) survey of the Site was carried out in April and May 2022, with additional surveys in January 2023 and July 2023 following changes to the Site boundary. The PEA surveys were undertaken to determine the habitats within the Site (following UKHab survey methodology); and to identify the potential for protected and notable species to be present.

6.4.4. Badger surveys and preliminary bat roost assessments of trees and structures (barns) on Site were also undertaken during the PEA walkover surveys detailed above.

6.4.5. Full details of all the PEA survey methodology can be found in **Appendix 6.1** and **Appendix 6.2**.

6.4.6. Further species-specific surveys of the Site which have been carried out in 2022 and 2023 comprise:

- Habitat Suitability Index (HSI) and eDNA survey of 13 ponds on Site for great crested newts (GCN) in May 2022 and April 2023. Full details of the survey methodology can be found in **Appendix 6.1** and **Appendix 6.2**.
- Breeding bird surveys of the Site in 2023. Full details of the bird survey methodology can be found in **Appendix 6.4**.
- Bat activity surveys were carried out in August 2022, October 2022, April 2023, July 2023 and September 2023. Full details of the bat survey methodology can be found in **Appendix 6.5**. N.B. the results of the September 2023 survey are not included, but will be included for the DCO application.
- No specific brown hare *(Lepus europaeus)* surveys were carried out. However, due to the abundance of brown hares seen across the Site, the numbers seen during the first breeding bird surveys in mid-April 2023 were collated to give an indicative total for the Site.

6.4.7. Further surveys planned in 2023/2024 comprise:

- A hedgerow survey along the proposed cable routes and potential access routes.
- Further bat surveys may be required once the design has progressed e.g., surveys of potential tree roosts or targeted bat activity surveys of hedgerows which may require removal for internal access tracks.
- Wintering bird surveys will involve up to four survey visits, between November 2023 and February 2024. The number of surveys may be curtailed if only low numbers of wintering birds are found in the first few visits.
- Notable arable non-crop plant surveys will be undertaken in targeted sample crop areas. This will involve survey visits in mid-May/June 2024 and August/September 2024 (to survey early and late flowering species).

6.4.8. Further surveys which may be required (depending on any updates to final design) may include:

- Bat roost surveys – including internal barn/building inspections, endoscope inspections, tree climbing and

emergence surveys. These will only occur if any trees and structures could potentially be directly or indirectly impacted by the construction of the Proposed Development, although it is currently envisaged this will not occur.

- Further bat activity surveys if any significant lengths of hedgerow need to be removed.
- Barn owl surveys, if any trees or structures with barn owl nesting potential are likely to be impacted.
- Water vole and otter surveys (if required if any bridges need to be installed across watercourses).

Design assumptions

6.4.9. **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 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.

6.4.10. **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.

6.4.11. The preliminary design principles and preliminary parameter plans set out the reasonable 'worst case scenario' that has been assessed within this chapter.

6.4.12. A precautionary approach to assessment has been carried out as baseline survey information is still continuing to be gathered. In the ES, consideration will be afforded to specific design case assumptions once more baseline data is gathered and design details are confirmed.

Embedded mitigation

6.4.13. 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. 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 biodiversity assessment comprise the following:

- Existing woodlands and tree belts will be retained as far as reasonably practicable.
- There will be a minimum 15m offset from the built development to existing woodland, whilst noting that it is possible that individual trees may need to be removed to facilitate construction. Standing advice recommends a buffer zone of at least 15m from the boundary of ancient woodland to avoid root damage (known as the root protection area). If there are any ancient or veteran trees on the woodland boundary, the buffer zone should be at least 15 times larger than the diameter of the tree. The buffer zone should be 5m from the edge of the trees' canopy if that area is larger than 15 times the trees' diameter. This will create a minimum root protection area[76].
- Existing hedgerows and trees will be retained as far as reasonably practicable.
- There will be a minimum 10m offset from the Proposed Development to all existing hedgerows and trees, where practicable. No ancient or veteran trees have yet been identified on the Site. If any are identified during further surveys, then the recommended buffer zones for veteran trees, detailed above, would apply to maintain a minimum root protection area.
- There will be a minimum 20m offset from the Proposed Development to locally designated wildlife sites, where practicable.
- Active badger setts will be retained where practicable and there will be a minimum offset of at least 30m from a badger sett. On completion of the final design and pre-construction badger surveys, it will be reviewed if any setts will require removal under licence.
- There will be a minimum offset of at least 10m either side of main rivers and 6m from ditches, where practicable.

Assessment methodology

6.4.14. The assessment methodology detailed in this chapter is in accordance with the CIEEM Guidelines. For this preliminary

[76] Natural England and Forestry Commission (2022) Guidance: Ancient woodland, ancient trees and veteran trees: advice for making planning decisions. Standing Advice. Ancient woodland, ancient trees and veteran trees: advice for making planning decisions - GOV.UK (www.gov.uk)

assessment, the potential likely effects on all identified receptors are reported, together with initial consideration of whether the effect is predicted to be significant or not.

6.4.15. The frames of reference used to describe the importance of each receptor, which are based on the CIEEM Guidelines, are as follows:

- International (i.e., Ramsar Sites, SACs and SPAs) (normally within the geographic area of Europe);
- UK or national (Great Britain but considering the potential for certain ecological features/receptors to be more notable (of higher importance) in England, with context relative to Great Britain as a whole).
- regional;
- county;
- district; and
- local (i.e., within approximately 5km of the Site).

6.4.16. For each ecological feature (receptor), only those characteristics relevant to understanding the ecological effect of the Proposed Development and determining the significance are described. The determination of the significance of effects has been made based on the predicted effect on the structure and function, or conservation status, of relevant ecological features (receptors), as follows:

- not significant - no effect on structure and function, or conservation status; and
- significant - structure and function, or conservation status is affected.

6.4.17. In addition, the CIEEM Guidelines require that significant effects should be qualified with reference to an appropriate geographic scale. Where possible in the context of this preliminary assessment, the geographical scale of the significant effect has been stated.

6.5. Summary of baseline conditions

6.5.1. The following section presents a summary of the baseline conditions for those receptors scoped into further assessment (see **Table 6.3** above). Full details of the baseline conditions can be found in the following appendices;

- **Appendix 6.1** - Preliminary Ecological Appraisal – Report 1
- **Appendix 6.2** - Preliminary Ecological Appraisal – Report 2 (land at Brauncewell)
- **Appendix 6.3** – Preliminary Ecological Appraisal – Report 3 (Grid Connection Corridor)

- **Appendix 6.4** - Breeding Bird Survey Report
- **Appendix 6.5** - Bat activity report

Navenby Heath Road Verges LWS, Gorse Hill Lane LWS and Gorse Lane LWS

6.5.2. These LWS are designated for calcareous grassland verges along the edges of road and farm trackways. Details on these LWS are provided in the Preliminary Ecological Appraisal Reports in **Appendix 6.1** and **Appendix 6.3**. Their indicative location is presented in **Figure 6.1**.

Hedgerows and trees (only those which may need to be permanently removed for internal access tracks)

6.5.3. It is not yet known which hedgerows will need to be permanently removed for internal access tracks as there are several options. Hedgerow surveys of all the hedgerows proposed to be removed for access and internal cable installation were carried out in August and September 2023. Hedgerow surveys of any hedgerows that may need to be removed for the Grid Connection Corridor will be carried out in 2023/2024. Details will be provided in the ES.

Rare or notable arable (non-crop) plants

6.5.4. The presence of rare or notable arable (non-crop) plants on Site is not yet known as no surveys have been undertaken (planned for 2024).

Ground nesting birds

6.5.5. Five breeding bird surveys were undertaken of the whole Site between March and July 2023 (full details of the surveys and results are shown in **Appendix 6.4**).

6.5.6. In summary, a total of 86 bird species were recorded on Site. Of these, 61 species were confirmed as breeding or potentially breeding.

6.5.7. The Site is considered of at least **County** importance for the farmland bird assemblage present as it supports a range of species including skylark (*Alauda arvensis*), corn bunting (*Emberiza calandra*), quail (*Coturnix coturnix*) and grey partridge (*Perdix perdix*), all of which have undergone significant declines in recent decades. Grassland fields and hedgerows were of greatest value to breeding birds, particularly skylark and grey partridge, whilst arable fields were used by yellow wagtails.

6.5.8. Both barn owl (*Tyto alba*) and marsh harrier (*Circus aeruginosus*) were observed during surveys. Two pairs of barn owl have been confirmed using barns within the Site however marsh harrier was not identified to be breeding.

6.5.9. Three curlews (*Numenius arquata*) were seen flying over the Site to and from a probable nesting location within grassland inside the boundary of RAF Digby. Curlew (*Numenius arquata*) were not found to be breeding on Site although they may occasionally use grassland or stubble within the Site for foraging. The Site is not considered suitable habitat for breeding curlew.

6.5.10. The background data search returned records of 38 bird species within 2km of the Site, of which 86% were recorded in RAF Digby. The full list of species returned from the desk study can be reviewed in **Appendix 6.1** and **Appendix 6.2**.

Wintering birds

6.5.11. The Site's importance for wintering birds is not yet known as no surveys have been undertaken (planned for November 2023-February 2024).

Bats

6.5.12. Bat activity surveys, using static bat detector deployment were undertaken in 2022 and 2023, detailed results are provided in the **Appendix 6.5**.

6.5.13. The surveys recorded a high diversity of species across the Site; with at least 10 of the 12 species considered to be present within Lincolnshire having been positively identified.

6.5.14. Although the landscape is mostly intensively farmed arable, which is normally considered to offer sub-optimal foraging habitat, the hedgerows, (where bat activity was mostly recorded), are of value to bats. In an agricultural landscape with limited natural features, those that are present can have greater importance.

6.5.15. The majority of bat activity was from common pipistrelle *(Pipistrellus pipistrellus)* and soprano pipistrelle *(Pipistrellus pygmaeus).* Barbastelle (*Barbastella barbastellus*) were the third most frequently recorded species. Other species included *Myotis* spp, Leisler's (*Nyctalus leisleri*), noctule (*Nyctalus noctule*), brown-long-eared (*Plecotus auratus*) and a small number of Nathusius' pipistrelle calls (*Pipistrellus nathusii*).

6.5.16. The assemblage of species within this geographic region of the UK could be considered of **National** importance. The Site could be of **Regional** importance for barbastelle and of **Local** importance for the remaining species identified.

6.5.17. Significantly more calls were recorded in August 2022 (which is the bat breeding season) therefore bats could be using mature trees or buildings within the Site for breeding or at least breeding near the Site and using the Site during the breeding season for foraging and commuting.

6.5.18. 71 individual trees and groups of trees were identified with moderate (35 trees) to high (36 trees) suitability for supporting roosting bats. Barns on Site could also be used by roosting bats.

Water voles and otter

6.5.19. There were no records of water vole (*Arvicola amphibius*) or otter (*Lutra lutra*) within 2km of the Site. Several watercourses within the Site were suitable for water voles. They were mostly too small for otter, however they may be used at night for foraging and individuals commuting as part of a much larger territory or home range. Although no specific water vole and otter surveys have been carried out it is considered likely that the watercourses on Site are potentially of **Local** importance for water voles and otter.

Sensitive receptors

6.5.20. In accordance with the CIEEM Guidelines, **Table 6.5** below presents the sensitive receptors that have been considered within this preliminary assessment, together with their respective geographical importance.

Table 6.5 Sensitive ecological receptors and geographical importance

Sensitive receptor	Geographical importance
Navenby Heath Road Verges LWS, Gorse Hill Lane LWS and Gorse Lane LWS	County
Hedgerows and trees (only those which may need to be permanently removed for internal access tracks)	Local
Rare or notable arable (non-crop) plants	Not yet known as no survey data (although considered potentially of Local importance if notable species found to be present)
Ground nesting birds	County
Wintering birds	Not yet known as no survey data (although considered likely of Local importance)
Bats	National importance
Water vole	Not yet known as no survey data (although considered likely of Local importance)
Otter	Not yet known as no survey data (although considered likely of Local importance)

Future baseline

6.5.21. This section considers those changes to the baseline conditions described above that might occur during the time period over which the Proposed Development will be in place. It considers changes that might occur in the absence of the Proposed Development being constructed.

6.5.22. The habitat within the Site is largely arable farmland, cropped on rotation, with some improved grassland and grass leys, bordered by hedgerows and arable field margins with small blocks of woodland and connecting wet and dry ditches. In the short to medium term, in the absence of the Proposed Development, these habitats will likely continue to be intensively managed as farmland, which would provide a number of species potential habitat such as arable farmland for ground-nesting breeding birds. The distribution of some species may change in response to cropping, whilst the assemblages will likely remain the same.

6.5.23. In the longer term, in the absence of the Proposed Development, habitats on Site will likely continue under agricultural management. The majority of existing habitats are likely to continue being present, although some changes in habitat extent, composition and structure will occur as a result of ecological succession, e.g., the gradual establishment of tree and shrub seedlings. These resultant gradual changes in habitat composition are unlikely to materially alter the ecological baseline and therefore the habitats and species present are very unlikely to undergo significant change.

6.5.24. Changing climatic conditions resulting from climate change may influence the resilience of certain habitats and species. Habitats such as broad-leaved trees and scrub will be more mature but are likely to support a broadly similar species assemblage and arable farmland will also be managed accordingly, maintaining broadly similar species assemblages.

6.6. Likely effects, additional mitigation and residual effects

6.6.1. Mitigation measures outlined below in **Table 6.6** will be documented within and secured by the Outline Construction Environmental Management Plan and the Outline Landscape and Ecological Management Plan.

Construction phase

Table 6.6 Assessment of likely effects, additional mitigation and residual effects during construction

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Navenby Heath Road Verges LWS, Gorse Hill Lane LWS and Gorse Lane LWS	Likely effects	Preparation of the Site and construction will result in dust generation, along with noise and visual disturbance. Navenby Heath Road Verges LWS, Gorse Hill Lane LWS and Gorse Lane LWS are verges bordering road and farm tracks (designated for calcareous grassland) at the north-western end of the Site (of Springwell West). These sites will be retained as part of the Proposed Development design. A works buffer will be retained around the sites, where possible. Further design work will confirm the distance of the buffer to be implemented. Noise and visual disturbance will not impact on the integrity or the functioning of these LWS, which are designated for grassland verge habitat. Dust pollution during construction, in the absence of mitigation, could cause a temporary adverse effect.
	Additional (secondary and tertiary) mitigation	Signage and security fencing around the works buffer zone will ensure that any works and construction traffic avoid the LWS sites. The implementation of standard environmental protection measures during construction, such as dust suppression and pollution prevention, will be adopted and these measures will be documented within and secured by the Outline Construction Environmental Management Plan. Monitoring throughout works should ensure compliance and implementation of pollution prevention measures.
	Likely residual effects	The LWS should not be directly affected by works. Any pollution from construction will be mitigated and therefore should not significantly affect the structure/function or conservation status of the LWS. The residual effect is predicted to be **negligible**, which is deemed to be **not significant**.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Hedgerows and trees (only those which may need to be permanently removed for internal access tracks and cable routes)	Likely effects	The Proposed Development will be designed to avoid hedgerow loss where practicable. It will include a minimum 10m buffer of panels from hedgerows and trees to protect roots and branches during construction works, where practicable. Sections of hedgerow (up to 25m wide) will need to be removed for underground cable installation; however, these will be replanted with like-for-like species as soon as practicable after construction. Limited, relatively small sections of hedgerow may also need to be cleared to widen internal access and create visibility splays at road access junctions (to widen existing gateways by up to 20m wide). This hedgerow removal would have an adverse effect, although would be relatively small scale and would be temporary for hedgerows which are to be replanted after cable installation. It is possible that only removal of small sections of hedgerow may be required to provide vehicle passing places. As a reasonable worst case assumption for the purposes of the PEIR, whole lengths of hedgerows may be required for internal access tracks. However, as it is currently unknown what quantity of hedgerow would need to be removed for internal access tracks, an assessment of the likely effect of this cannot be determined at present until the access design details are confirmed.
	Additional (secondary and tertiary) mitigation	Control measures documented within and secured by the Outline Construction Environmental Management Plan will safeguard protection against dust and soil pollution; security fences will ensure provision of hedgerow buffers and tree protection zones during construction works. Monitoring should ensure hedgerows and trees are protected from pollution and 10m buffer is maintained during construction.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
	Likely residual effects	It is currently not known what quantity of hedgerow would need to be removed for internal access tracks, therefore an assessment of the likely effect of this cannot be fully determined at present until the access design details are confirmed. However, it is anticipated that the effects would be **not significant** as mitigation and compensation planting will likely offset any hedgerow loss after construction.
Rare or notable arable (non-crop) plants	Likely effects	If notable arable (non-crop) plants are found to be present on Site, field margins, where certain rare or notable plants are most likely to be found, will be protected by 10m buffer from panels. In any areas which cannot be avoided (e.g., for Solar PV module installation or construction traffic), then there may potentially be some temporary habitat loss during construction. This is expected to have a temporary adverse effect as arable non-crop plants should re-establish from the seed bank in topsoil.
	Additional (secondary and tertiary) mitigation	Measures to safeguard notable non-crop plants where appropriate will be documented within and secured by the Outline Construction Environmental Management Plan (e.g., control measures to safeguard against dust and soil pollution; and storage and re-instatement of topsoil). Monitoring should ensure appropriate removal and storage of topsoil, 10m buffer from field margins and protection from pollution.
	Likely residual effects	The residual effect is predicted to be **not significant**.
Ground nesting birds	Likely effects	There will be loss of breeding and foraging habitat for ground nesting birds, with construction activities creating displacement through disturbance and due to the placement of Solar PV modules. There is a

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		need for bespoke mitigation for ground nesting birds. If unmitigated the loss of breeding and foraging habitat could have a significant effect on the conservation status of ground nesting birds during the construction phase.
	Additional (secondary and tertiary) mitigation	Habitat creation and enhancement measures to maintain habitat for ground nesting birds and to increase the foraging habitat available will be documented within and secured by the Outline Landscape and Ecological Management Plan. Measures to protect areas retained for farmland birds will be documented within and secured by the Outline Construction Environmental Management Plan, including security fencing to maintain buffer zones to avoid noise and visual disturbance and signage.
	Likely residual effects	Although there will be some temporary loss of foraging and nesting habitat and disturbance during construction works, mitigation is considered likely to maintain the existing farmland bird assemblage and the adverse effect is considered to be temporary. The residual effect is therefore predicted to be **not significant**, as construction of the Proposed Development should not have a significant effect on the conservation status of ground nesting birds using the Site.
Wintering birds	Likely effects	If the Site is found to be important for wintering birds, there is potential for disturbance of wintering birds and loss of foraging habitat due to the placement of Solar PV modules. The potential collision impact from the provision of two new towers is anticipated to be relatively low risk (as discussed above). If unmitigated, the loss of foraging habitat could have a significant effect on the conservation status of wintering birds during the construction phase.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
	Additional (secondary and tertiary) mitigation	Measures to protect any areas retained for wintering birds will be documented within and secured by the Outline Construction Environmental Management Plan and the Outline Landscape and Ecological Management Plan, including security fencing to maintain buffer zones to avoid noise and visual disturbance and signage.
	Likely residual effects	It is considered mitigation will be effective to maintain the conservation status of wintering birds. The residual effect is therefore predicted to be **not significant**.
Bats	Likely effects	Construction activities which could potentially affect bats include removal of hedgerows which may disrupt flight paths, removal of trees used as roosts, disturbance and lighting. Furthermore, changes to habitat due to the placing of Solar PV modules could affect some species of bats which may be less inclined to forage over them[77]. However, as discussed in **Table 6.2**, the current, albeit limited, research indicates that although bats may confuse smooth flat surfaces with water bodies, it seems unlikely that this would have direct detrimental effects on bat populations and therefore the installation of Solar PV modules is not anticipated likely to significantly affect their conservation status. During the surveys, significantly more bat activity was found along hedgerows and field margins rather than in-field. Hedgerows, trees, watercourses and field margins will be protected by a 10m buffer and woodland will be protected by a 15m buffer from built development, where practicable, which should prevent significant disturbance to bats using hedgerows and trees for roosting, foraging or commuting. A substantial proportion of the Site will be enhanced for foraging and dispersing bats (i.e., will not

[77] Tinsley E., Froidevaux J. S. P., Zsebők S., Szabadi K. L., Jones G. (2023). Renewable energies and biodiversity: Impact of ground-mounted solar photovoltaic sites on bat activity. Journal of Applied Ecology. Published by John Wiley & Sons Ltd on behalf of British Ecological Society.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		have any Solar PV development). Therefore, the placement of Solar PV modules is not anticipated to cause a significant adverse effect on the conservation status local bat population. However, it is not currently known what quantity of hedgerow would need to be removed to widen internal access tracks and whether this would just require temporary removal. Therefore, a full assessment of the likely effect on bat foraging/commuting cannot be currently determined at this stage. Any hedgerow or tree removal will be assessed for likely effects on bats and the mitigation hierarchy will be used to avoid by design, where practicable, or else mitigate/compensate effect. Further targeted bat surveys, once access design has progressed, may be required to enable an informed assessment of likely effect on bats.
	Additional (secondary and tertiary) mitigation	If any trees with bat roost potential cannot be avoided, e.g., for the cable installation, they will be surveyed to determine presence/likely absence of a roost. Any loss of bat roosts will be mitigated and compensated under European Protected Species licensed mitigation works. Once the amount of hedgerow which needs to be removed is quantified, then an appropriate strategy will be documented within and secured by the Outline Construction Environmental Management Plan and the Outline Landscape and Ecological Management Plan. The requirement for any construction lighting to be directed away from hedgerows and trees will be documented within and secured by the Outline Construction Environmental Management Plan. Security fencing will maintain a 10m works buffer from hedgerows and trees. A monitoring programme will ensure implementation of mitigation measures, as documented within and secured by the Outline Construction Environmental Management Plan.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
	Likely residual effects	As per the 'Precautionary Principle'[78] it is assumed that there could be a **significant adverse** effect up to District level on bats (due to the possibility of removal of hedgerow lengths for internal access tracks) until further survey and design information is provided to enable a full assessment.
Water vole	Likely effects	Maintaining a minimum 10m and 6m works buffer from main rivers and ditches respectively, where practicable, should avoid harm to water voles. However, installation of any bridges across watercourses, if required, could damage water vole burrows and any pollution from works could affect water quality. If unmitigated, this could cause significant adverse effect.
	Additional (secondary and tertiary) mitigation	If required, further survey will determine the presence or likely absence of water vole. If present and impact from bridge installation cannot be avoided, then mitigation measures would be undertaken to displace them to avoid harm. Pollution prevention mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan. Signage and fencing will be used to maintain minimum 10m and 6m works buffer to protect main rivers and ditches respectively where required. A monitoring programme will ensure implementation of mitigation measures, as documented within and secured by the Outline Construction Environmental Management Plan.
	Likely residual effects	Although the design has not yet confirmed if any bridges are required, it is anticipated they would be limited in number and effect would be very localised and relatively small scale. It is considered mitigation will be effective to maintain the conservation status of water

[78] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland. The Chartered Institute of Ecology and Environmental Management's (version 1.2 updated April 2022).

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		vole. The residual effect is therefore predicted to be **not significant**.
Otter	Likely effects	Maintaining a minimum 10m and 6m works buffer from main rivers and ditches respectively, where practicable, should avoid disturbance to otters, which may be using them for foraging or commuting at night. Any pollution from works could affect water quality, which if unmitigated could cause significant adverse effect.
	Additional (secondary and tertiary) mitigation	Pollution prevention mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan. Signage and fencing will be used to maintain minimum 10m and 6m works buffer to protect main rivers and ditches respectively, where required. A monitoring programme will ensure implementation of mitigation measures, as documented within and secured by the Outline Construction Environmental Management Plan.
	Likely residual effects	It is considered mitigation will be effective to maintain the conservation status of otter. The residual effect is therefore predicted to be **not significant**.

Operational phase

Table 6.7 Assessment of likely effects, additional mitigation and residual effects during operation

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Ground nesting birds	Likely effects	Any operational works on the solar farm would be relatively small scale and localised which should not cause significant visual or noise disturbance. Vegetation under the Solar PV modules, as well as areas created or enhanced for ground nesting birds, would be managed to avoid adverse impact to ground nesting birds (e.g., any vegetation

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		removal would be undertaken outside of the main nesting season where appropriate). It is anticipated that there would be a negligible effect on ground nesting birds by ensuring sufficient areas of open ground remain as breeding and foraging habitat.
	Additional (secondary and tertiary) mitigation	Habitat creation, enhancement and a management/monitoring programme will be documented within and secured by the Outline Landscape and Ecological Management Plan.
	Likely residual effects	The residual effect is predicted to be beneficial at the Local level from an increase in invertebrate diversity and overall enhancement of foraging habitat for some bird species due to habitat creation and enhancement measures along field boundaries, field margins and the management of the land underneath the Solar PV modules. The determination of whether this effect will be significant or not will be confirmed in the ES.

Decommissioning phase

6.6.2. The effects of decommissioning of the Proposed Development are likely to be similar to those for construction outlined above. Habitats and protected or notable species are likely to be subject to temporary loss of habitat or disturbance during decommissioning activities and appropriate measures will need to be put in place to minimise direct loss of habitat and disturbance. An Outline Decommissioning Environmental Management Plan will be submitted in support of the DCO, which will outline how such impacts will be managed.

Assessment against future baseline

6.6.3. The Proposed Development should provide an overall significant gain in biodiversity, against the future baseline of continued intensive management for agricultural production, by implementing the above biodiversity design measures for habitat creation and enhancement. Substantial net gain in biodiversity value is anticipated which will be documented within and secured by the Outline Landscape and Ecological Management Plan.

6.7. Opportunities for environmental enhancement

6.7.1. As discussed previously, the Site is mostly intensively managed arable farmland and therefore there are opportunities proposed to enhance strategic areas of the Site, which could provide a significant gain in biodiversity. Proposals that would be beneficial to wildlife, such as birds, bats and brown hare will be documented within and secured by the Outline Landscape and Ecological Management Plan, which include:

- Retain strategic areas within the Site, to be managed as suitable habitat for ground nesting birds as necessary and appropriate;
- Create large set aside areas for habitat (calcareous grassland in the west and wetter grassland to the east) which will benefit both ground nesting birds and foraging bats;
- Protection of woodlands;
- Hedgerows and trees protected, where practicable;
- New hedgerows and scrub created;
- Margins enhanced by planting winter wild bird seed mix; tussocky grass mix; and wildflower mix (10m buffer); and
- Under solar panels, three different treatments are proposed including chalk wildflower (west side), herbal leys rich in legumes and grass rich for grazing. This would provide foraging e.g., for birds, brown hares and nectar for invertebrates which in-turn will provide food for birds and bats that feed on them.

6.8. Intra-project combined effects

6.8.1. The effects identified already account for impacts arising from the various aspects of the Proposed Development. There are various adverse effects from construction works such as visual disturbance, dust, noise and vibration which, in-combination, increases the magnitude of effect e.g., disturbance to nesting birds. The significance of these combined affects has been accounted for in this preliminary assessment.

6.8.2. Similarly, planting proposed to mitigate landscape and visual effects will have a combined effect with biodiversity enhancement proposals, as landscaping works will also increase biodiversity value and will be located in areas where its addition would benefit existing habitats or designated sites through connectivity or buffering.

6.8.3. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

6.9. Difficulties and uncertainties

6.9.1. 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.

6.9.2. The design of the Proposed Development is still evolving. Therefore, there are uncertainties about whether further surveys are required at this stage, particularly in relation to the location of the internal access tracks to inform the assessment of effect on these specific hedgerows and bats which may use them.

6.9.3. There have been no significant limitations with ecology surveys undertaken to date and the baseline condition surveys are considered robust.

6.9.4. The baseline surveys could be valid for up to three years if there have been no significant changes to habitats on the Site, although this may depend on species. An ecologist would need to review, undertake a site visit and potentially update desk study information in order to review the validity of the reports[79].

6.10. Further work to inform the ES

6.10.1. Hedgerow surveys (to assess ecological importance) of the proposed cabling routes were carried out in August 2023. Hedgerow surveys of the Grid Connection Corridor will be carried out in 2024. The results will inform the ES.

6.10.2. Bat surveys were completed in September 2023 for the northern fields at north-west edge and land near Brauncewell in Springwell West. The bat report will be updated with the survey data for these areas once the data have been analysed. Further bat surveys may be required once the design has progressed e.g., surveys of potential tree roosts or targeted bat activity surveys of hedgerows which may require removal for internal access tracks.

6.10.3. Wintering bird surveys will be carried out between November 2023 and February 2024.

6.10.4. Notable arable (non-crop) plant surveys will be carried out in mid-May/June 2024 and possibly also in August/September 2024 if required (depending on crop rotation).

6.10.5. Water vole and otter surveys may be required once the design has progressed, and it is known if any bridges are to be installed across watercourses. Water vole surveys can be undertaken between mid-April and September. Two survey visits should be undertaken: one

[79] CIEEM (2019) Advice Note on the Life Span of Ecological reports and Surveys. April 2019. Chartered Institute of Ecology and Environmental Management. Hampshire. [redacted]

from mid-April to June and one from July to September. Otter surveys can be undertaken throughout the year.

6.10.6. Further consultation with relevant stakeholders including North Kesteven District Council, Lincolnshire County Council, Natural England and Lincolnshire Wildlife Trust is proposed to be undertaken.

6.10.7. Once all baseline data has been gathered and design details are confirmed, then the potential effects of the Proposed Development can be reviewed and fully assessed within the ES. Appropriate avoidance or mitigation measures will be documented within and secured by the Outline Construction Environmental Management Plan and the Outline Landscape and Ecological Management Plan, detailing the management of landscape and ecological features.

7. Climate

7.1. Introduction

7.1.1. 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 climate.

7.1.2. The very nature of the Proposed Development is to mitigate against climate change, in order to align with relevant climate change legislation and planning policies, particularly with regards to the UK Climate Change Act 2008 (amended 2019) which is aligned with the goals of the Paris Agreement.

7.1.3. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR), with particular reference to **Appendix 4.1 - 4.3 and Appendix 7.1** presented in **Volume 3**.

7.2. Consultation, scope and study area

Consultation undertaken to date

7.2.1. An Environmental Impact Assessment (EIA) Scoping Report, presented in **Appendix 4.1**, setting out the proposed climate assessment scope and methodology for the Proposed Development, was submitted to the Planning Inspectorate in March 2023. A Scoping Opinion, presented 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 climate in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

7.2.2. Aside from the EIA Scoping process, no specific consultation has been undertaken to inform this preliminary assessment. Engagement with Lincolnshire County Council and North Kesteven District Council will be undertaken to inform the ES.

Scope of the assessment

7.2.3. 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.

7.2.4. As documented in **Appendix 4.2** and **Appendix 4.3**, in relation to climate no major alterations have been made to the proposed scope as set out in the EIA Scoping Report, with climate resilience remaining scoped out for all phases of the Proposed Development,

and greenhouse gas (GHG) emissions remaining scoped in for all phases of the Proposed Development. The Scoping Opinion agreed that an assessment of the resilience to flooding could be scoped out of the climate assessment, and **Chapter 2: Description of the Proposed Development** explains how the Proposed Development has been designed to be resilient to high heat and increased wind speeds. **Table 7.1** and **Table 7.2** below set out the receptors and matters that have been scoped out of, or into, further assessment.

Receptors/matters scoped out of further assessment

7.2.5. **Table 7.1** presents the receptors/matters that are scoped out of further assessment, with appropriate justification. Where a change has occurred to the approach proposed within the EIA Scoping Report, this is clearly stated and justified

Table 7.1 Receptor/matters scoped out of further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Climate resilience	Construction, operation and decommissioning	The UK Climate Projections published in 2018 (UKCP18)[80] projections suggest that climate change will lead to hotter drier summers, warmer wetter winters, increased likelihood of extreme weather events (e.g., heat waves, high rainfall events) and sea level rise of up to 1.15 m (by 2070 in London, assuming a high-emissions scenario). Due to the embedded resilience of solar panels to high heat and wind speeds, low risk of Site flooding and the Site's distance from the coast, these factors are not expected to significantly impact the construction, operation or	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.

[80] The UK Climate Projections (UKCP) (2018). Met Office. Available online: [redacted]

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		decommissioning of the Proposed Development.	

Receptors/matters scoped into further assessment

7.2.6. **Table 7.2** 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 7.2 Receptor/matters scoped into further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
GHG emissions	Construction	Embodied carbon of solar PV modules (e.g., the emissions from manufacture, processing and transport of materials) can be relatively high and construction-related emissions should be considered in relation to overall lifecycle emissions of the Proposed Development, to determine an accurate 'carbon-payback' time 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 agreed with this approach.
	Operation	Given the proposed operational life of around 40 years, the cumulative effect of GHG reductions associated with the operation of the Proposed Development will likely provide significantly beneficial effects.	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.

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
	Decommissioning	The decommissioning process is likely to result in GHG emissions, particularly from disposal of solar PV modules and any ESS. It is important to include all emissions when considering the overall lifecycle emissions of the Proposed Development, to determine an accurate 'carbon payback' time for the Proposed Development.	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.
In-combination climate change impacts	Operation	Requested to be included by the Scoping Opinion in consideration of solar panels "potential to alter precipitation runoff rates and patterns".	Change - this matter was not considered within the EIA Scoping Report, but the Scoping Opinion has requested it to be considered. Following further consideration, the Applicant agrees with this opinion.

Extent of the study area

7.2.7. The sensitive receptor for GHG emissions is the global climate, which is considered highly sensitive to GHG fluctuations. By proxy, the sensitive receptor can also be extended to the UK's commitments under the UK Climate Change Act 2008 (amended 2019), which aligns with the goals of the Paris Agreement to avoid dangerous climate change by limiting global warming to well below 2°C and pursuing efforts to limit it to 1.5°C.

7.2.8. The Proposed Development has the potential to affect the climate by the addition and avoidance of GHG emissions in comparison to the baseline and future baseline scenario.

7.2.9. The scope of the GHG assessment includes the addition of GHG emissions directly from construction, operational, and decommissioning activities undertaken within the footprint of the Proposed Development, including site fuel consumption (construction and decommissioning).

7.2.10. It will also extend to include emissions which will occur outside the proposed Site boundary, but related to the activities of the Proposed Development, including those from:

- the extraction, manufacture, and transportation of materials to the construction site (construction); and
- the transportation of workers to Site (construction).

7.2.11. This preliminary assessment will also consider the GHG savings from the Proposed Development as a result of displacing fossil-fuel based energy in the National Grid.

7.3. Legislative framework, planning policy and guidance

Relevant legislation and planning policy

7.3.1. The legislative and planning policy relevant to the assessment of climate change is summarised in **Table 7.3**.

Table 7.3 Legislative and planning policy relevant to climate change

Relevant legislation/planning policy	Summary
The 2015 Paris Agreement	The Paris Agreement is a legally binding international treaty which commits Parties to the United Nations Framework Convention on Climate Change to objectives to reduce GHG emissions, with the view to limiting the global average temperature rise to well below 2˚C above pre-industrial levels, whilst "pursuing efforts to limit the temperature increase to 1.5˚C". The Agreement is revisited five-yearly to allow Parties to the Convention to evaluate and enhance the level of ambition of their climate action plans, known as nationally determined contributions (NDCs).
United Nations Framework Convention on Climate Change	The United Nations Framework Convention on Climate Change came into force on 21 March 1994 and sought to stabilise the atmospheric concentrations of greenhouse gases at "safe levels". The Convention provides an overall framework for international government efforts to address the challenge posed by climate change. Currently there are 197 parties signed

Relevant legislation/planning policy	Summary
	up to the Convention. The Convention embodies a series of review mechanisms. The 21st session of the Conference of the Parties (COP21) which was held in Paris in December 2015 resulting in a legally binding global climate change target agreed by all 197 member parties with the aim of capping climate change well below 2°C of warming. The outcome of the 26th session in Glasgow in November 2021 (COP26) was a package of decisions, resolutions and statements that formalised how the commitments made at COP21 would be enacted. COP26 covered three key themes around climate change: adaptation; finance (including increasing support to developing companies) and mitigation, with the aim to limit the rise in global average temperature to 1.5°C above pre-industrial levels.
Kyoto Protocol	The Kyoto Protocol was an international treaty with the aim to reduce global GHG emissions. It was adopted in 1997 and came into force in 2005. It outlined six categories of GHG emissions weighted by their global warming potential and aggregated to give total greenhouse gas emissions in CO_2 equivalents. The Kyoto Protocol was effectively replaced by the Paris Agreement, which came into effect in 2016.
EU Renewable Energy Directives	The Renewable Energy Directive 2018/2001/EI came into force in December 2018. It created a new binding target for member states to achieve a renewable energy target of 32% by 2030. There is the potential for this to be revised upwards in 2023. The UK notified the EU of its intention to leave the union in March 2017. The European (Withdrawal) Act 2018 (as amended by the European (Withdrawal Agreement) Act 2020) requires that the EU laws, rules and greenhouse gas emissions targets which have been set in respect of climate change through European law, are transferred into UK domestic governance.
The UK Climate Change Act 2008 (amended 2019)	The Climate Change Act 2008 set a target of reducing GHG emissions by at least 80% by 2050, relative to

Relevant legislation/planning policy	Summary
	the baseline year of 1990. The Act further established the Climate Change Committee (CCC) as an independent, statutory body to advise the UK and devolved governments on emission reduction targets and report to Parliament on progress. The CCC is further tasked with the production of the UK Climate Change Risk Assessment, followed by a National Adaptation Programme to address those risks every five years. In 2019, the emission targets set out in the Climate Change Act 2008 were made more ambitious by the Climate Change Act 2008 (2050 Target Amendment) Order 2019, thereby making the UK the first major global economy to commit to a net zero target requiring a net reduction of emissions by 100% relative to 1990 levels by 2050. It therefore constitutes a legally binding commitment to end the UK's contribution to climate change by 2050.
The Climate Change Committee (carbon budgets)	The CCC is an independent statutory body established under the Climate Change Act 2008 to advise the UK government and Devolved Administrations on reducing GHG emissions and preparing for climate change. The CCC undertakes an annual assessment of GHG emissions to determine whether the UK is on course to meet its target carbon budget. These budgets are presently set as follows: Carbon budget: 1st (2008 – 12); Carbon budget level ($MMtCO_2e$): 3,018; % reduction below base year: 23 Carbon budget: 2nd (2013 – 17); Carbon budget level ($MMtCO_2e$): 2,782; % reduction below base year: 29 Carbon budget: 3rd (2018 – 22); Carbon budget level ($MMtCO_2e$): 2,544; % reduction below base year: 35

Relevant legislation/planning policy	Summary

4th (2023 – 27)	1,950	50
5th (2028 – 32)	1,725 (1,765 incl. international shipping)	57
6th (2033 – 37)	965 (incl. international aviation and shipping)	78

In its most recent budget report (released in December 2020), the CCC recommended that the UK set a Sixth Carbon Budget which requires a reduction of emissions of 78% by 2035, relative to 1990 levels (63% reduction from 2019). This represents a world-leading commitment which is consistent with the over-arching objectives of the Paris Agreement. In addition to this, the CCC further recommended that the UK set a similarly ambitious pledge to reduce GHG emissions by at least 68% by 2030, relative to 1990 levels, noting that this should form part of the UK's NDC ahead of COP26 (November 2021).

The CCC's 2023 Report to Parliament identifies that "the deployment of solar capacity is significantly off track to meet the Government's target of 70GW by 2035".

The Overarching National Policy Statement for Energy (NPS EN-1) (2011)	Details the planning policy for the energy sector. It states that *"…moving to a secure, low carbon energy system is challenging, but achievable*." It sets out the need and urgency for new energy infrastructure to be consented and built as soon as possible. It stipulates the UK Climate Projection and emissions scenario requirements for a climate change risk assessment, should this be undertaken.

Relevant legislation/planning policy	Summary
Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)	Section 3 sets out the importance of nationally significant energy infrastructure projects and explicitly includes solar generation within its scope. It recognises the urgent need for renewable technologies in order to achieve Net Zero and ensure affordable energy security. It further recognises the importance of electricity storage to mitigate against the intermittency of renewable electricity generation. Section 5 details the requirement for a GHG assessment as part of the environmental statement, to include construction, operation and decommissioning impacts. This must be used "to drive down GHG emissions at every stage of the proposed development and ensure that emissions are minimised as far as possible for the type of technology". The impact of any residual GHG emissions and their impacts on national and international efforts to limit climate change must be detailed.
National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)	Builds upon the National Policy Statement for Energy (EN-1). It does not include specific reference to solar energy.
Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)	Introduces a new section (Section 2.10) on solar photovoltaic generation, recognising that solar farms are one of the most established renewable electricity technologies in the UK and the cheapest form of electricity generation worldwide. It states that solar is important to deliver national energy security, and references the British Energy Security Strategy, whereby a five-fold increase in solar deployment is expected by 2035, up to 70GW.
National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2011)	References the consideration of whether a project makes a considerable contribution to the promotion renewable energy, the achievement of climate change objectives and the maintenance of energy security. It references the requirements of NPS EN-1 to ensure the resilience to climate change is considered if applicable, with regards to flooding, wind, storms, increased heat and earth movement caused by flooding or drought.

Relevant legislation/planning policy	Summary
Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023)	Does not introduce any new content with regards to climate or solar energy developments.
National Planning Policy Framework (NPPF) (September 2023)	The NPPF presents several requirements and considerations related to climate change. These provisions aim to guide local authorities and developers in addressing climate change issues within the planning process. The framework specific to climate change is broken down into three sections: • Planning for climate change; • Planning and flood risk, and; • Coastal change. The framework recognises the dual approach of mitigation (reducing greenhouse gas emissions) and adaptation (preparing for the impacts of climate change) as essential components of climate action. Local planning authorities are encouraged to develop local plans and policies that integrate climate change considerations. This includes setting out policies to reduce carbon emissions and adapt to future climate risks. In line with this, local authorities are expected to prioritise low-carbon developments and the development of renewable energy sources, such as wind, solar, and biomass; with the framework indicating that planning authorities should support their development, provided they are environmentally and socially sustainable.
North Kesteven Climate Emergency Action Plan (2023)	North Kesteven's Climate Emergency Action Plan establishes the specific actions to be undertaken without the council and district towards reaching net zero and addressing the climate emergency. The plan identifies nine key areas in which action will be focussed: decision-making, communication and engagement, adaptation, buildings, transport, natural environment, energy, industry, and waste and water.

Relevant legislation/planning policy	Summary
	The energy theme focuses on "reducing fossil fuel dependence and associated emissions by promoting renewable energy generation opportunities for both North Kesteven District Council and the District."

Applicable guidance

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

- Institute of Environmental Management and Assessment (IEMA) *Assessing Greenhouse Gas Emissions and Evaluating their Significance* (2022);
- British Standards Institution *PAS 2080 – Carbon management in Infrastructure* (2023);
- The Greenhouse Gas Protocol *Corporate Accounting and Reporting Standard* (2004) ("GHG Protocol");
- Royal Institution of Chartered Surveyors (RICS) *Whole Life Carbon Assessment for the Built Environment* (2017); and
- Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government *Planning Practice Guidance on Climate Change* (2019).

7.4. Methodology

Data sources to inform baseline characterisation

7.4.1. Data required to undertake the lifecycle GHG assessment has been provided by the Applicant and processed using the methodology below. The data that has informed this preliminary assessment is provided in **Appendix 7.1**.

Surveys to inform baseline characterisation

7.4.2. No surveys or site visits have been undertaken to inform this preliminary assessment.

Design Assumptions

7.4.3. **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.

7.4.4. **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.

7.4.5. The design principles and parameters that have been applied in relation to climate are detailed below.

Construction

7.4.6. To estimate emissions from construction a 48-month construction period has been assumed.

7.4.7. The quantity of materials for the Proposed Development is based upon the information in **Chapter 2: Description of the Proposed Development**, alongside more specific product information provided by the Applicant and publicly available data (e.g., typical material composition of products), where required. This information has been used to estimate embodied emissions associated with material use.

7.4.8. Emissions from materials have been quantified by utilising One Click LCA (a life cycle assessment tool for calculating building and infrastructure whole life carbon emissions), Environmental Product Declarations, Inventory of Carbon and Energy (ICE) (University of Bath, 2019) and Department for Energy Security and Net Zero's conversion factors (UK Government, 2023) to use the most accurate densities and emission factors as possible. An emission factor is a generic value indicative of emissions associated with a certain activity or product. Product-specific emissions factors have not been applied at this stage due to the preliminary design stage of the Proposed Development.

7.4.9. Conversions between mass, volume and area have been calculated where appropriate to allow the application of specific emissions factors. In addition, some material types, build ups, weights and dimensions were based on publicly available information, where required.

7.4.10. To estimate construction fuel use, details of the anticipated construction plant has been provided by the project team. Average fuel efficiency data (litres per hour) was gathered using publicly

available information for each piece of construction plant. It was estimated for the purposes of the PEIR that plant would be in operation 12 hours a day, 5 days a week, at 50% capacity. This would be for a duration of 48 months.

7.4.11. To calculate emissions from the transportation of materials associated with the various elements of the Proposed Development, the project team provided the expected country or continent of manufacture, which has been used to estimate delivery distances. It should be noted, however, that the infrastructure manufacturers utilised for the Proposed Development may be subject to change and the source assumptions used are conservative to represent a reasonable worst-case scenario. The Applicant is actively strengthening their existing procurement process to make every effort to prevent any negative impact on people and the environment. The assessed components and source location are outlined below:

- Solar panels would be sourced from China;
- Solar panel frames and foundations would be sourced from Europe – based on publicly available data it was assumed they would be manufactured in Italy;
- Inverter transformer stations and inverters would be sourced from Asia and Europe – based on publicly available data it was assumed 50% would be sourced from China, and 50% from Italy;
- Battery Energy Storage System (BESS) would be sourced from China;
- BESS containers and control containers would be sourced from the UK (100km delivery distance);
- Transformers would be sourced from Europe – based on publicly available data it was assumed they would be sourced from Portugal; and
- Construction plant would be sourced from UK (100km delivery distance).The quantification of transport emissions uses the tonne kilometre unit, equivalent to the transport of one tonne over one kilometre.

7.4.12. Construction workers would be UK based and assumed to have an each-way commuting distance of 25km over 48 months. This distance is a conservative assumption based upon distance to major nearby towns (e.g., Lincoln). It has been assumed that all commuting would be undertaken in cars, comprising 60% petrol- and 40% diesel-fuelled based upon UK government vehicle licensing statistics.

Operation

7.4.13. It has been assumed that the Proposed Development will be in operation from 2030 and will have an installed capacity of 800MW, and generation of 952,320MWh in the first year. A degradation factor of 0.4% has been applied each year to account for year-on-year reduction in yield.

7.4.14. To estimate emissions associated with the maintenance and replacement of the various assets during the operational phase, the following assumptions have been applied:

- 175% of the inverters would be replaced over the operational lifetime of the Proposed Development; this is equivalent to all the inverters being replaced 1.75 times on average.
- Approximately 48% of the total emissions associated with the construction and operation of the Springwell substation would be allocated to maintenance and replacement. This is based on the LETI Climate Emergency Design Guide proportions for commercial buildings.
- 150% of the BESS would be replaced over the lifetime of the Proposed Development; this is equivalent to all the BESS being replaced 1.5 times on average.
- 5% of the transformers would be replaced over the lifetime of the Proposed Development.

7.4.15. The above proportions take into account product, transport and decommissioning emissions associated with the replacement and maintenance of the relevant assets as these are the key associated emission sources. No replacement has been assumed for the solar panels given that there will be 0.7% module spares delivered with the initial construction materials to cover the operational life of the solar farm. It has been assumed that no replacement would be required for the inverter transformer stations, BESS containers and solar PV frames. This assumption is based on data from similar solar farm projects.

7.4.16. In addition to the emissions associated with asset replacement and maintenance, the following assumptions have also been applied to estimate emissions from operational worker transport:

- Two technician visits per year, with a one-way commuting distance of 100km, all travelling via petrol cars.
- 8 regular on-site workers every day, with a one-way commuting distance of 25km, all travelling via battery electric vehicles.
- 5 additional visits for washing and grass cutting, 3 times a year, with a one-way commuting distance of 25km, all travelling via petrol cars.

Decommissioning

7.4.17. It has been assumed that all materials would be either re-used or recycled at the end of their operational life, with the exception of approximately 1% of transformer materials assumed to go to landfill at end of life. This has largely been based on publicly available data.

7.4.18. For decommissioning fuel use, it has been estimated that the fuel required would be 50% of the fuel used during the construction stage, as per *Whole Life Carbon Assessment for the Built Environment*, Royal Institution of Chartered Surveyors Professional Standard, 2nd edition, best practice guidance.

Embedded mitigation measures

7.4.19. 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. 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: EIA Methodology**. Those embedded mitigation measures relevant to this preliminary climate assessment comprise the following:

- The use of concrete will be minimised.
- All members of the supply chain will provide a carbon reduction plan.

7.4.20. Vegetation may need to be cleared to facilitate access and cable routes that form part of the Proposed Development. However, the carbon sequestration potential of the land is likely to increase based on the proposed planting of new hedgerows and trees.

Assessment methodology

7.4.21. This preliminary assessment establishes present and future baseline GHG emissions. Aligned with the GHG Protocol, it quantifies applicable Kyoto Protocol GHGs as measured in tonnes of carbon dioxide equivalence (tCO2e), where equivalence means having the same warming effect as CO_2 over 100 years. The six original Kyoto Protocol gas groups are CO_2, methane (CH4), nitrous oxide (N2O), hydrofluorocarbons (HFCs), sulphur hexafluoride (SF6) and perfluorocarbons (PFCs). Nitrogen trifluoride (NF3), a chemical released in certain high-tech industries, was added in 2013. The global warming potential (GWP) of each is presented in **Table 7.4**.

Table 7.4 Kyoto Protocol GHGs and their global warming potential (GWP) based upon Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report (AR5)

Greenhouse gas/group	Chemical formula	GWP (CO_2e)
Carbon dioxide	CO_2	1
Methane	CH_4	28
Nitrous oxide	N_2O	265
Hydrofluorocarbons	HFCs	Depends on specific gas (~4 – 12,400)
Sulphur hexafluoride	SF_6	23,900
Perfluorocarbons	PFCs	Depends on specific gas (~6,630 – 11,100)
Nitrogen Trifluoride	NF_3	16,100

7.4.22. Data associated with the activities contributing to the construction of the Proposed Development have been provided by the project team. Where it has not been possible to obtain this data, as this preliminary assessment represents a forecast of emissions and some information may not yet be known, secondary data (such as estimates, extrapolations, benchmarks, and proxy data such as distance travelled) have been used. Emissions have then been quantified by applying the most relevant and up-to-date emission factors.

7.4.23. An emission factor is a representative value that relates the quantity of a pollutant released into the atmosphere with an activity associated with the release of that pollutant. Emission factors are typically available from government publications, independent agencies, and scientific research journals however, the quality and accuracy of such factors can vary significantly. Factors can differ depending on the research body and/or underlying methodologies applied. It is, therefore, good practice to apply emission factors only from reputable sources.

7.4.24. The approach to this preliminary GHG assessment follows the GHG Protocol's core principles:

- **Relevance**: selecting an appropriate inventory boundary that reflects the GHG activities of the Proposed Development and serves the decision-making needs of users.

- **Completeness**: accounting for all emission sources within the chosen inventory boundary, with any specific exclusions disclosed and justified.
- **Consistency**: aiming to collect meaningful and consistent data over time whilst transparently documenting any significant changes to data quality and/or format.
- **Transparency**: addressing all relevant issues in a coherent and clear manner.
- **Accuracy**: minimising uncertainty and avoiding systematic over- or under-quantification of emissions, and ensuring any necessary estimates or assumptions required are conservative and guided by industry standards.

7.4.25. In line with the GHG Protocol and the Institute of Environmental Management and Assessment's *Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance* (2022), a materiality threshold of 1% may be set whereby emissions that are expected to contribute to less than 1% of the overall emissions inventory may be excluded from the assessment.

Assessment criteria and assessment of significance

7.4.26. Impact assessments normally assess to what degree the Proposed Development will affect the baseline environment of the study area. In the case of GHG emissions, any emissions will have a long-term, irreversible negative effect on the global climate, which is considered to be highly receptive to any emissions of GHGs. A specific source of GHG emissions cannot be linked to impacts at a specific location but will have impacts globally.

7.4.27. This preliminary GHG assessment therefore evaluates the significance of emissions based upon guidance from Institute of Environmental Management and Assessment's *Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance* (2022), which provides a framework of determining significance against the goals of the Paris Agreement (i.e., against a science-based 1.5°C trajectory) (see **Table 7.5**).

7.4.28. The Institute of Environmental Management and Assessment's guidance acknowledges that some projects may replace existing development or baseline activity with a higher GHG profile and thus the significance of a project's emissions should be based on its net impact over its lifetime, which may be positive, negative or negligible. It states that significance should not be determined purely on the magnitude of GHG emissions, but whether a project contributes to reducing GHG emissions consistent with a trajectory towards net zero by 2050.

7.4.29. If GHG emissions cannot be avoided, a goal of the EIA process should be to identify mitigation options to reduce the project's residual emissions at all stages. If GHG emissions remain significant but cannot be further reduced, approaches to compensate the project's remaining emissions should be considered.

Table 7.5: IEMA's Guidance to assessing GHG significance (2022) Framework for assessment of significant effects

Significance	Level	Criteria
Significant	Major adverse	Project adopts a business-as-usual approach, not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement (i.e., a science-based 1.5°C trajectory). GHG impacts are not mitigated or reduced in line with local or national policy for projects of this type.
	Moderate adverse	Project's GHG impacts are partially mitigated, and may partially meet up-to-date policy; however, emissions are still not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement.
Not significant	Minor adverse	Project may have residual emissions, but the project is compatible with the goals of the Paris Agreement, complying with up-to-date policy and good practice.
	Negligible	Project has minimal residual emissions and goes substantially beyond the goals of the Paris Agreement, complying with up-to-date policy and best practice.
Significant	Beneficial	Project causes GHG emissions to be avoided or removed from the atmosphere, substantially exceeding the goals of the Paris Agreement with a positive climate impact.

7.4.30. The UK's GHG inventory and corresponding five-year carbon budgets provide a framework to measure the amount of GHG emissions the UK is legally permitted to emit per five-year period to stay aligned with the goals of the Paris Agreement (see **Table 7.6**). The determination of significance will therefore reference the appropriate budget period in which the emissions arise.

7.4.31. The UK is currently in the 4th carbon budget period, which runs from 2023-27. The construction program for the Proposed Development

falls within this 4th carbon budget. The operational phase emissions have been compared to the appropriate and available carbon budgets within the design life of the Proposed Development. These comprise the 5th and 6th carbon budgets, which span 2028-2032 and 2033-2037 respectively. Beyond this date, no carbon budgets have been published.

7.4.32. The UK carbon budgets are useful for context. However, rather than comparing the Proposed Development's emissions to national carbon budgets, a more appropriate proxy would be a comparison against those of the local authority area.

7.4.33. Based on 2021 data published by the UK Government (the latest available data at the time of writing), the North Kesteven local authority area emits 0.24% of the total UK emissions (based upon North Kesteven local authority area emissions of 974.4 ktCO2e and national emissions of 399,046.1 ktCO2e). The North Kesteven local authority area carbon budget has therefore been based upon 0.24% of the national Carbon Budget and is displayed in **Table 7.6**.

Table 7.6 UK and North Kesteven local authority area carbon budgets

Carbon budget	Carbon budget level (MMtCO2e)	North Kesteven local authority area proportional emissions budget (ktCO2e)
1st (2008 – 12)	3,018	737
2nd (2013 – 17)	2,782	679
3rd (2018 – 22)	2,544	621
4th (2023 – 27)	1,950	476
5th (2028 – 32)	1,725	421
6th (2033 – 37)	965	236

7.5. Summary of baseline conditions

7.5.1. There is currently no existing infrastructure within the Site boundary. The Site mainly consists of agricultural land, predominantly fields interspersed with hedgerows, small woodland blocks and farm access tracks. It is used for arable production but with limited livestock use e.g., sheep rearing. It is assumed that no ruminant livestock utilise the Site.

7.5.2. The GHG baseline comprises the existing carbon stock and possible minor emissions sources. These minor emissions sources may comprise vehicle fuel and fertiliser use, with possible contributions from the land depending on soil and vegetation types. In line with the Institute of Environmental Management and Assessment's *Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance* (2022), if a site currently has no development or significant activity, the baseline can be considered to have zero GHG emissions, to ensure a reasonable worst-case approach to establishing the net GHG effect.

Sensitive receptors

7.5.3. The sensitive receptor for GHG emissions is the global climate, which is considered highly sensitive to GHG fluctuations.

Future baseline

7.5.4. No change is expected for the future baseline when compared to the current baseline. It is unlikely that under a future 'business-as-usual' scenario there would be any significant changes to the amount of GHG emissions from the Site, either positive or negative.

7.6. Emissions sources

7.6.1. This section sets out the key anticipated emissions sources associated with the Proposed Development. For this preliminary assessment, some emissions sources have not been quantified due to their assumed small magnitude and/or lack of specific information. These emissions sources have been identified in the tables below; the ES will include an assessment of these sources.

7.6.2. Results within the tables of this report are accurate to the number of significant figures presented. Any inconsistencies in totals versus individual values are due to rounding and should not be viewed as erroneous.

Construction phase emissions sources

7.6.3. The preliminary GHG assessment of construction emissions has calculated the life cycle emissions for the building materials and systems, accounting for their embodied emissions, construction, maintenance, repair and replacement emissions.

7.6.4. **Table 7.7** provides an indication of the key emissions sources which are anticipated during the construction phase of the Proposed Development. The total construction GHG emissions have been estimated to be 522,606 tCO_2e, with 90% comprising those from the product stage (also known as embodied carbon).

Table 7.7 Anticipated key emissions sources during the before-use stage

Life cycle boundary	Emissions source	Description	Total emissions (tCO_2e)	Proportion of total construction emissions
Product stage (A1 – A3)	Raw material extraction	Embodied emissions associated with the production of material used for the construction of the Proposed Development.	470,562	90%
	Precursor product processing			
	Product manufacture			
	Packaging			
	Transport to factory gate			
Construction process stage (A4 – A5)	Transport to site	Emissions associated with the transport of equipment, materials and members of staff to the site of the Proposed Development.	20,657	4%
	Construction activities	Emissions associated with the consumption of fuels onsite for the purposes of construction of the Proposed Development.	31,387	6%
	Waste	Emissions associated with the disposal of waste generated onsite.	Unable to calculate at this stage	N/A

Life cycle boundary	Emissions source	Description	Total emissions (tCO_2e)	Proportion of total construction emissions
	Land use change	Emissions due to the loss of carbon from vegetation and soil carbon.	Unable to calculate at this stage	N/A
Total			**522,606**	**100%**

7.6.5. The largest emission source from the overall construction phase is embodied emissions from the BESS (61%), followed by the Solar PV modules (25%). A breakdown of the embodied emissions sources for the different components is provided below in **Table 7.8**.

Table 7.8 Embodied emissions from the manufacture of materials and components

Component	Embodied emissions	Proportion of total emissions
Battery storage (BESS)	284,800	61%
BESS containers and control containers	251	0.1%
Solar PV Modules	117,878	25%
Inverters	176	0.04%
PV framework	63,336	13%
Springwell Substation	230	0.05%
Transformers	3,291	1%
Inverter Transformer Stations	600	0.1%
Cables	No data provided	N/A
Concrete	No data provided	N/A

Component	Embodied emissions	Proportion of total emissions
Aggregate	No data provided	N/A
Total	**470,562**	**100%**

Operational phase emissions sources and savings

GHG emissions

7.6.6. Total operational emissions have been estimated to be 445,815 tCO_2e, the majority of which (98%) come from the replacement of the BESS over the lifetime of the Proposed Development (see **Table 7.9**).

Table 7.9 Use stage emissions from maintenance and replacement of the components and worker transportation

Component	Use stage emissions	Proportion of total emissions
BESS	436,615	98%
Inverters	960	0.2%
Springwell Substation	216	0.05%
Transformers	166	0.04%
Worker Transportation	7,860	2%
Total	**445,815**	**100%**

7.6.7. The carbon sequestration potential of the land is likely to increase based on the proposed planting of new hedgerows and trees. In the absence of detailed landscaping plans, the carbon sequestration potential has not been quantified for the purposes of this preliminary assessment. This will be considered in the ES.

GHG savings

7.6.8. GHG savings as part of the operation of the Proposed Development and the displacement of fossil-fuel derived electricity within the

National Grid are expected to be significant and have been quantified below.

7.6.9. The Proposed Development is anticipated to have an installed capacity of 800MW, and generation of 952,320MWh in the first year. Taking into account an annual degradation factor of 0.4%, the total energy generation from the proposed 40-year operational life is approximately 35,266,691 MWh.

7.6.10. To determine the GHG savings of the Proposed Development, the emissions intensity of electricity generation has been calculated. Only operational emissions are included to ensure consistency with the methodology of the UK government electricity emissions factors, which only take into account operational emissions per kWh generated, and not the emissions associated with the construction or decommissioning of any associated energy infrastructure.

7.6.11. Dividing the operational emissions of the Proposed Development (445,817 tCO_2e) by the lifetime energy generation (35,266,691 MWh) gives a total carbon intensity value of 12.64 gCO_2e/kWh. This value is likely to change and become more refined as more information about the Proposed Development becomes available.

7.6.12. Based on the most recently published data (Department for Energy Security and Net Zero and Department for Business, Energy and Industrial Strategy (BEIS), 2023), the UK National Grid generates GHG emissions of 225 gCO2e/kWh at point of generation. These emissions are mainly from the fossil-fuel component of the energy mix (for 2022 this predominantly comprised natural gas at 38.5%, imported mixed energy sources at 5.5% and coal at 1.5%). The operational emissions of the Proposed Development therefore represent a 94% reduction in emissions per kWh compared to the current UK electricity fuel mix.

7.6.13. Due to the increase in renewable energy inputs, the UK National Grid is projected to decarbonise to an expected carbon intensity of 2.28g by 2050[81]. The Proposed Development therefore may have a higher carbon intensity than the National Grid during the latter part of its lifetime (specifically from 2043 based upon current projections).

7.6.14. This does not mean that the Proposed Development does not have an overall positive impact on the UK's ability to meet its climate targets. The renewable electricity from the Proposed Development is directly replacing that generated by fossil-fuel energy, and so to allow for a more meaningful comparison, the emissions per kWh can be compared against that directly from fossil-fuel generated electricity. Operational emissions from a Combined Cycle Gas Turbine (CCGT) have been used as a comparison, as it is currently

[81] https://www.gov.uk/government/publications/valuation-of-energy-use-and-greenhouse-gas-emissions-for-appraisal

the most carbon-efficient fossil-fuelled technology available. The carbon intensity of a CCGT is 354 gCO_2e/kWh, and so the Proposed Development will emit 341 g fewer CO_2e per kWh than if the same electricity were generated by a gas fired CCGT, representing savings of 96%.

7.6.15. Over the proposed 40-year lifetime of the Proposed Development, this equates to GHG savings of over 12 million tonnes CO_2e.

Decommissioning phase emissions sources

7.6.16. GHG emissions from decommissioning of the Proposed Development have been identified, aligned with standard practice for Life Cycle Assessments (**Table 7.10**). These emissions are subject to a high level of uncertainty, as the decommissioning conditions cannot be predicted approximately 40 years into the future.

Table 7.10 Anticipated key emissions sources during the end of life stage

Description	Total emissions (tCO_2e)	Proportion of total decommissioning emissions
End of life (C1-4)	62,474	100.0%

Summary lifecycle emissions

7.6.17. The predicted GHG emissions of the Proposed Development are displayed in **Table 7.11**. Product stage construction emissions are the largest emissions source (46%), followed by those product stage emissions from the replacement of materials over the 40-year lifetime.

Table 7.11 Lifecycle emissions from the Proposed Development during construction, operation and end-of-life

Description	Total emissions (tCO_2e)	Proportion of total emissions
Product stage (A1 – A3)	470,562	46%
Construction process stage (A4 – A5)	52,044	5%
Operation (B1 – B9)	445,815	43%

Description	Total emissions (tCO_2e)	Proportion of total emissions
End of life (C1 – C4)	62,792	6%
Total GHG emissions (not including any GHG savings from operation)	**1,031,214**	

7.7. Likely effects, additional mitigation and residual effects

7.7.1. Preliminary GHG impacts have been assessed for each phase of the Proposed Development (construction, operation and decommissioning). It is important to understand the impacts at each phase, particularly with regards to identifying hotspots to facilitate mitigation efforts. However, the net impact of the Proposed Development must be considered across the entire lifecycle due to the long-term and cumulative nature of GHG emissions across the lifetime of the Proposed Development.

Construction phase

Table 7.12 Assessment of likely effects, additional mitigation and residual effects during construction

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
GHG emissions	Likely effects	The GHG impact of construction is anticipated to result emissions of 522,606 tCO2e. Whilst this is large in comparison to North Kesteven local authority area carbon budget for 2023-27, it represents 0.027% of the national carbon budget for this period. As this renewable energy will be going into the National Grid, it is appropriate to compare these emissions against the national carbon budget.
	Additional (secondary and tertiary) mitigation	A large majority of GHG emissions associated with the Proposed Development comprise those embodied emissions from infrastructure, primarily the BESS and Solar PV modules. The most effective mitigation will therefore

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
	be in the responsible sourcing of materials and infrastructure. Environmental Product Declarations should be required and scrutinised for materials and equipment wherever possible, most particularly for the BESS and Solar PV modules. Use of products with lower embodied/pre-use phase emissions will significantly improve the carbon balance of the Proposed Development. In addition to procurement, measures to decrease GHG emissions from the construction process phase will be documented within and secured by the Outline Construction Environmental Management Plan and the Outline Construction Traffic Management Plan. These are anticipated to include: • Implementing measures to decrease fuel use by maximising energy efficiencies, for example to ensure all vehicles switch off engines when stationary and ensure construction vehicles are well maintained and conform to current emissions standards. • Promoting the use of sustainable fuels in construction vehicles, and where possible making use of electric vehicles to reduce fuel consumption. • Liaising with construction staff to minimise GHG emissions associated with commute to site, including provision of staff minibuses, and promoting of lower carbon modes of travel such as car sharing options and use of public transport. • Using locally sourced and/or produced materials. The use of recycled aggregates, where appropriate, for foundations,

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		subbases, hard-standings and pavement materials. • Carrying out actions to meet the waste hierarchy in accordance with the principles of the Government's Resources and Waste Strategy 2018. Promoting the recycling of materials by segregating construction waste to be re-used and recycled where practical.
	Likely residual effects	Even if all the proposed additional mitigation measures were applied to maximum effect, there would still be a certain unavoidable amount of GHG emissions during the construction phase. The construction emissions are therefore anticipated to have a **minor adverse** (**not significant**) effect on the climate.

Operational phase

Table 7.13 Assessment of likely effects, additional mitigation and residual effects during operation

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
GHG emissions	Likely effects	The operation of the Proposed Development will result in GHG emissions savings as a result of the displacement of fossil-fuel derived electricity within the National Grid. These equate to savings of over 12 million tCO_2e compared to gas-generated electricity.
	Additional (secondary and tertiary) mitigation	As the overall impact on the receptor during this phase is positive, no additional mitigation measures are required.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
	Likely residual effects	The operation emissions savings are anticipated to have a **beneficial** (**significant**) effect on the climate.

Decommissioning phase

Table 7.14 Assessment of likely effects, additional mitigation and residual effects during decommissioning

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
GHG emissions	Likely effects	The GHG impact of decommissioning is anticipated to result in emissions of 62,792 tCO_2e. This is a conservative figure based upon worst-case assumptions, and the actual emissions from decommissioning cannot be accurately predicted 40 years into the future. The UK Government has not released carbon budgets for the year of decommissioning, but it is likely that emissions from the Proposed Development will be low in magnitude in comparison to carbon budgets.
	Additional (secondary and tertiary) mitigation	Due to the potential advancements in technology and best practice between the present and the time in which decommissioning will take place, it is difficult to accurately propose additional mitigation at this time. However, mitigation as part of the decommissioning phase will be documented within and secured by the Outline Decommissioning Environmental Management Plan.
	Likely residual effects	Even if all additional mitigation measures were applied to maximum effect, there would still be a certain unavoidable amount of GHG emissions during the decommissioning phase. The decommissioning emissions savings are therefore anticipated to have a **minor adverse** (**not significant**) effect on the climate.

Net significance

7.7.2. Renewable energy developments such as the Proposed Development have a major role to play in the transition to a low carbon economy, and the decarbonisation of the UK National Grid. Without projects like the Proposed Development, the GHG intensity of the UK's electricity generation would not decrease as projected and would severely compromise the UK's ability to meet its carbon reduction targets.

7.7.3. Emissions from the construction, operation and decommissioning of the Proposed Development total 1,031,214 tCO2e (**Table 7.11**), whilst operational savings are over 12 million tCO2e. The net GHG savings, compared against equivalent gas-fired electricity generation, are therefore over 11 million tonnes of CO2e.

7.7.4. Therefore, the Proposed Development overall is considered likely to have a **beneficial** (**significant**) effect on the climate.

7.8. Climate in-combination assessment

7.8.1. The Scoping Opinion requested that the "potential to alter precipitation runoff rates and patterns" be scoped into the assessment.

7.8.2. The climate projections displayed in **Table 7.15** have been extracted from the UKCP18 data developed by the UK Climate Impacts Programme. The projections displayed cover the indicative lifetime of the Proposed Development at the 10th, 50th and 90th probability level for the RCP 4.5 (intermediate emissions) and RCP 8.5 (high emissions) scenario.

Table 7.15 Projected change in precipitation rate in the East Midlands area, showing 50th,10th and 90th percentile

Climate variable	RCP 4.5		RCP 8.5	
	2020 – 2039	**2040 – 2059**	**2020 – 2039**	**2040 – 2059**
Annual precipitation rate anomaly (%)	+1.5 (-5.1 to + 8.8)	-2.1 (-10.1 to + 6.5)	+1.6 (-5.7 to + 9.0)	-2.1 (-11.1 to + 6.9)

7.8.3. Precipitation in the East Midlands area is expected to increase in the short term (2020 – 2039) and decrease in the longer term (2040 – 2059) under both climate scenarios. The range of probabilities is highly variable.

7.8.4. The Solar PV modules used as part of the Proposed Development will measure up to approximately 2.4m in length, 1.3m in width with a depth of up to 30mm and consist of a series of photovoltaic cells beneath a layer of toughened glass. The spacing between the rows of PV modules will vary across the Site, with a minimum separation space of 3m.

7.8.5. It is not anticipated that the installation of the Solar PV modules will involve the introduction of significant hardstanding at ground level, ensuring minimal superficial cover compared to baseline. In addition, the Solar PV modules will have regular rainwater gaps to prevent concentration of water along a single drip line.

7.8.6. Surface water run-off will be controlled using water management techniques informed by Sustainable Drainage Systems (SuDS). The Site will be planted with native species including grassland and wildflower mixes. This planting will ensure that water that falls from the drip line will be intercepted by vegetation, promoting water interception and infiltration potential, and limiting channelisation from surface water run-off from Solar PV modules.

7.8.7. Given the embedded mitigation proposed, it is deemed that there is no significant risk of detrimental effects on the environment arising as a result of the increased precipitation rates predicted during 2020 – 2039 and the Solar PV modules altering precipitation runoff rates and patterns.

7.9. Opportunities for environmental enhancement

7.9.1. The nature of the Proposed Development offers an enhancement to the original environment in terms of GHG emissions. It is expected that its operation will reduce emission by 96% compared against a gas-fired energy source, equating to GHG savings of over 12 million tonnes CO_2e over 40 years.

7.10. Difficulties and uncertainties

7.10.1. The information provided in this PEIR is preliminary and is based on the information available at the time of writing. A number of smaller emissions sources have been omitted due to a lack of data available at this time. This includes the cables, concrete and aggregate used during construction. The final assessment of likely significant effects will be reported in the ES.

7.10.2. The accuracy of a GHG assessment depends on the quality of the data provided. Primary data should be used where available; however, the fact that this preliminary assessment represents a forecast from a future scenario means that all data is ‘secondary’ (extrapolated, estimated or benchmarked). Assessments such as this, based largely on secondary data, should be viewed as an estimate of GHG emissions impact, and actual emissions may vary.

7.10.3. To mitigate against this, a conservative approach has been adopted, whereby a reasonable worst-case scenario has been assumed. For example, the infrastructure manufacturer for the Proposed Development has not yet been selected, and it has been assumed that Solar PV modules and BESS will be sourced from China.

7.11. Further work to inform the ES

7.11.1. This preliminary assessment has considered the main expected material sources of GHG emissions for the Proposed Development. However, there are specific emissions sources that have not yet been quantified. These include:

- Waste and land-use change as part of the construction phase;
- The embodied emissions of specific materials and infrastructure; and
- Operational emissions, including auxiliary power, repair and maintenance of the Site.

7.11.2. The climate assessment presented within the ES will include an assessment of these sources, informed by the final project design and in conjunction with input from the project design team.

7.11.3. Engagement with Lincolnshire County Council and North Kesteven District Council will be undertaken to inform the ES.

8. Cultural Heritage

8.1. Introduction

8.1.1. This chapter presents the preliminary environmental information and a preliminary assessment of the likely significant environmental effects arising from the construction and operation (including maintenance) of the Proposed Development upon cultural heritage.

8.1.2. As proposed in the EIA Scoping Report and agreed through the Scoping Opinion received, impacts during decommissioning have not been considered within this preliminary assessment. Refer to **Section 8.2** below for further detail.

8.1.3. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR) with particular reference to the following appendices presented in **Volume 3**:

- **Appendix 8.1** – Archaeological Desk Based Assessment (DBA);
- **Appendix 8.2** – Aerial Investigation Report;
- **Appendix 8.3** – Geophysical Report;
- **Appendix 8.4** – Listed Building Visibility; and
- **Appendix 8.5** – Listed dwellings in settlements over 1km from the Site.

8.1.4. **Chapter 9: Landscape and Visual** considers cultural heritage assets in so much as they contribute to landscape character and its perceived value.

8.2. Consultation, scope and study area

Consultation undertaken to date

8.2.1. An EIA Scoping Report, as provided in **Appendix 4.1**, setting out the proposed cultural heritage 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 cultural heritage in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

8.2.2. **Table 8.1** provides a summary of the consultation activities undertaken in support of the preparation of this preliminary assessment, out with the EIA Scoping process.

Table 8.12 Summary of consultation undertaken

Consultee	Key matters raised	Actions in response to consultee comments
Lincolnshire County Council Heritage Team – email correspondence 11th October 2022	Consulted on written scheme of investigation (WSI) for geophysical survey.	WSI for geophysical survey agreed.
Lincolnshire County Council Heritage Team – email correspondence and virtual meeting 15th September 2023	Emailed the proposed evaluation strategy along with the Archaeological DBA (**Appendix 8.1**), aerial investigation and mapping report and geophysical survey results. Initial response reiterated need for trenching to include apparently blank areas and across the full impact zone.	A detailed proposal for further evaluation will be discussed with Lincolnshire County Council's and North Kesteven District Council's heritage advisors.
Historic England – virtual meeting held on 20th June 2023	Introduced project, work carried out so far including summary geophysical survey results. Historic England recommended producing a deposit model to map the distribution of buried deposits of archaeological interest across the Site and investigate the reasons for differences in the distribution of geophysical anomalies of likely archaeological origin across the Site.	Deposit modelling of the Site is in progress and will inform further discussions on the scope of evaluation.

Scope of the assessment

8.2.3. 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.

8.2.4. Subsequent to the submission of the EIA Scoping Report, a Stage 1 Setting assessment has been completed for the designated heritage assets within 5km of the Site and non-designated assets

within 2km of the Site. This is presented in **Appendix 8.1** and has informed the selection of assets for inclusion in this preliminary assessment where they may experience likely significant effects as a result of change within their setting. This has resulted in a shorter list of receptors (assets) for inclusion in the assessment than was proposed in the EIA Scoping Report due to there now being a greater understanding of how setting contributes to the significance of the assets. Assets that lie outside the Zone of Theoretical Visibility (ZTV) for the Proposed Development (**Figures 9.5 - 9.9**) have been scoped out following this Stage 1 Setting assessment.

8.2.5. The geophysical survey results have informed the design parameters for the Proposed Development, avoiding impacts on a number of non-designated heritage assets (some previously recorded, and others identified through this survey). The archaeological assets which lie outside areas where ground disturbance as a result of the Proposed Development will occur have also been scoped out of this preliminary assessment as they will not experience construction phase effects.

Receptors/matters scoped out of further assessment

8.2.6. **Table 8.2** 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 8.13 Receptor/matters scoped out of further assessment

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Effects of operational lighting on heritage assets	Operation	CCTV lighting will be infrared (not visible) and lighting for the Springwell Substation compound, BESS compounds, and Collector Compounds will be manually operated, directional and only operated in case of emergency or when maintenance is required to be undertaken during hours of darkness. There will be no permanent or movement activated lighting at night. No assets have been identified for which such temporary increases in nighttime illumination would affect the contribution of setting to their significance.	Change - this matter was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this matter has been considered. However, the Applicant is of the opinion that this matter does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Listed K6 telephone kiosks	Construction and operation	No physical impacts to the K6 telephone kiosks is predicted due to their distance from the Site. The K6 telephone kiosks are listed for their architectural interest which is appreciated in close proximity. Their surroundings make a neutral contribution to their significance as they are found in a variety of contexts throughout the UK. No significant effects are predicted as a result of visual change within their wider surroundings.	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Findspots recorded by Lincolnshire County	Construction and operation	As findspots, these have been removed from the Site and the heritage significance of their	No change – these receptors were proposed to be scoped out of further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Council HER (see **Table A8.3** in **Appendix 8.4** for details)		former locations will not be harmed by the Proposed Development.	assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Milepost 20 metres south of Ashby Lodge Farm, Grade II Listed Building (NHLE Ref: 1061824)	Operation	The positive contribution made by setting to the significance of the milepost derives from its relationship with the road network, and this would not be altered by the Proposed Development during operation	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Avro Lancaster crash site (Lincolnshire County Council HER Ref: MLI25416)	Operation	The significance of this asset does not draw on its wider surroundings	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Hawker Hurricane crash site (Lincolnshire County Council HER Ref: MLI25417)	Operation	The significance of this asset does not draw on its wider surroundings	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Sites of former extractive pits in Ashby de la Launde and Bloxholm, and Rowston	Construction and operation	The Archaeological DBA (**Appendix 8.1**) has concluded that the archaeological interest of these former extractive pits (recorded on superseded OS mapping) is	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report but the Scoping Opinion has requested they be scoped in. However, the Applicant is of the opinion that these receptors should

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		low[82]. The effects of the Proposed Development on the significance of these assets would be minor and not significant.	remain scoped out of further assessment for the reasons outlined in the 'Justification' column.
Car dyke Scheduled Monument (four sections designated individually: NHLE 1004925, 1004926, 1004960 and 1005484)	Construction and operation	No physical impacts predicted as the asset is outside the Site. Only two of the sections are predicted to have any visibility of the Proposed Development and the positive contribution of setting to the significance of the monument will not be altered.	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Scheduled and listed village crosses in Wellingore, Dorrington and Cranwell (NHLE 1009214/1061856, 1254204, 1009224/1254082)	Construction and operation	No physical impacts are predicted as these assets are outside the Site. The contribution of setting to the significance of these assets will be unaffected by the Proposed Development, and they are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – these receptors were not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for

[82] Appendix 8.1 Annex 1

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			the reasons outlined in the 'Justification' column.
Scheduled and listed village crosses in Metheringham, Digby and Rowston (NHLE 1005022, 1009229/1254084, 1009230/1359364)	Construction and operation	No physical impacts are predicted as these assets are outside the Site. No change to the setting of these assets is predicted (no elements of the Proposed Development will be visible from the assets or from areas where they are appreciated and they are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects).	Change – these receptors were not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Remains of preceptory church, Temple Bruer (NHLE 1007686)	Construction and operation	No physical impacts are predicted as these assets are outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Catley Priory (NHLE 1017524)	Construction and operation	No physical impacts are predicted as this asset is outside the Site.	Change – this receptor was not considered within the EIA Scoping

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		No change to the setting of this asset is predicted (no elements of the Proposed Development will be visible from the asset or from areas where it is appreciated and the asset is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects).	Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Nocton Park Priory (NHLE 1018898)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. No change to the setting of this asset is predicted (no elements of the Proposed Development will be visible from the asset or from areas where it is appreciated and the asset is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects).	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Castle Hill Ringwork (NHLE 1020436)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. No change to the setting of this asset is predicted (no elements of the Proposed Development will be visible from the asset or from areas where it is appreciated and the asset is sufficiently removed from the Site	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		that noise, dust etc. during construction will not lead to significant effects).	not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Neolithic long barrow (NHLE 1013916)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this monument will not be affected.	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Boothby Graffoe, Navenby, Metheringham, Martin and Wellingore Conservation Areas	Construction and operation	No physical impacts are predicted as these assets are outside the Site. No change to the setting of these assets is predicted and the assets are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – these receptors were considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
147 Listed Buildings not predicted to have visibility of the Proposed Development (see **Appendix 8.4** for details)	Construction and operation	No physical impacts are predicted as these assets are outside the Site. No change to the setting of these assets is predicted and the assets are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – these receptors were not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Listed Churches: Church of St Oswald (NHLE 1061750), Church of St Andrew (NHLE 1061976), Church of St Clement (NHLE 1064293), Church of the Holy Cross (NHLE 1064299), Church of St Thomas A Becket (NHLE 1254176), Church Tower to the north of Temple Farmhouse (NHLE 1254328), Church of St Mary	Construction and operation	No physical impacts are predicted as these assets are outside the Site. No change to the setting of these assets is predicted and the assets are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – these receptors were not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
(NHLE 1261473), Church of All Saints (NHLE 1308424), Church of the Holy Cross (NHLE 1359365).			
College Hall at Royal Air Force Cranwell (NHLE 1254079) and gates and gate lodges to College Hall at RAF Cranwell (NHLE 1254080)	Construction and operation	No physical impacts are predicted as these assets are outside the Site. The contribution of setting to the significance of these assets will be unaffected by the Proposed Development, and they are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – these receptors were not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Walcote War Memorial (NHLE 1455118)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development, and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			assessment for the reasons outlined in the 'Justification' column.
J R Scott's Almshouses (NHLE 1254327)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development, and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Wellingore Hall and attached RC Church of St Augustine (NHLE 1147738) and Gates and wall to Wellingore Hall (NHLE 1360572)	Construction and operation	No physical impacts are predicted as these assets are outside the Site. The contribution of setting to the significance of these assets will be unaffected by the Proposed Development and they are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – these receptors were not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Farmhouses and agricultural buildings	Construction and operation	No physical impacts are predicted as these assets are outside the Site.	Change – these receptors were not considered within the EIA Scoping

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
over 1km from the Site (see **Table A8.4** in **Appendix 8.4** for details)		The contribution of setting to the significance of these assets will be unaffected by the Proposed Development, and they are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Stable block with attached cottage at Thorpe Tilney Hall (NHLE 1064304) & orangery and attached garden wall at Thorpe Tilney Hall (NHLE 1280630)	Construction and operation	No physical impacts are predicted as these assets are outside the Site. The contribution of setting to the significance of these assets will be unaffected by the Proposed Development and they are sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – these receptors were not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, these receptors have now been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
The Old Workhouse Cottages and attached outbuilding (NHLE 1147685)	Construction and operation	No physical impacts are predicted as these assets are outside the Site. The contribution of setting to the significance of these assets will be unaffected by the Proposed Development, and they are	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Wellingore Garage (NHLE 1406722)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change – this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Listed dwellings within settlements over 1km from the Site (see **Appendix 8.5** for details)	Construction and operation	No physical impacts are predicted due to the distance of the assets to the Site. The positive contribution made by setting to the significance of residential listed buildings within settlements is confined to their immediate street scene and does not draw on views of the wider surroundings. No significant effects are therefore predicted. Most of these assets also lie outside the ZTV for the Proposed Development.	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report but the Scoping Opinion has requested they be scoped in. However, the Applicant is of the opinion that these receptors should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Village Lock Up (NHLE 1254194)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Pair of outbuildings to rear of no's 17-23 (NHLE 1254081)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Pigeoncote to rear of no 7 (NHLE 1254408)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		removed from the Site that noise, dust etc. during construction will not lead to significant effects.	submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
The Marquis Of Granby (NHLE 1147781)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Pump south of no 24 (NHLE 1061826)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			assessment for the reasons outlined in the 'Justification' column.
Kirkby Green Mill (NHLE 1064295)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Wellingore Mill (NHLE 1147665)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Scopwick Mill (NHLE 1280676)	Construction and operation	No physical impacts are predicted as this asset is outside the Site.	Change - this receptor was not considered within the EIA Scoping Report, but due to changes in the

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	design of the Proposed Development and additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Obelisk 4 metres south east of number 4 Rookery Lane (NHLE 1254209)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Horse Monument 10 metres north west of April Cottage (NHLE 1261367)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		during construction will not lead to significant effects.	of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
The Old School (NHLE 1205521)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Sundial 3 metres east of The Close (NHLE 1308375)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Ashby Hall (NHLE 1061827)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Home Farmhouse (NHLE 1061825)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Farmyard north of The Firs (NHLE 1280661)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Farmyard to the north of Number 10 (NHLE 1064296)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Beckside Farmhouse (NHLE 1205530)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			assessment for the reasons outlined in the 'Justification' column.
Gates to Blankney Hall (NHLE 1359358)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
The Old Rectory (NHLE 1254208)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Brauncewell Lodge (NHLE 1261461)	Construction and operation	No physical impacts are predicted as this asset is outside the Site.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Gresham (NHLE 1280651)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Kirkby Green Millhouse (NHLE 1280667)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		construction will not lead to significant effects.	assessment for the reasons outlined in the 'Justification' column.
2 and 4 Main Street (NHLE 1360598)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
26 and 28 Main Street (NHLE 1360599)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
25 Beckside (NHLE 1064294)	Construction and operation	No physical impacts are predicted as this asset is outside the Site.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
37 and 39 Main Street (NHLE 1064297)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
15 Main Street (NHLE 1064298)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		construction will not lead to significant effects.	assessment for the reasons outlined in the 'Justification' column.
97-103 Main Street (NHLE 1064300)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
High House (NHLE 1064301)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Cottage to West of Kirkby Green Mill (NHLE 1205538)	Construction and operation	No physical impacts are predicted as this asset is outside the Site.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
47 Main Street (NHLE 1205570)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the offsetting of panels the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Archway 20 metres south of the vicarage (NHLE 1064302)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. The contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			assessment for the reasons outlined in the 'Justification' column.
Church of St Oswald (NHLE 1064285)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the design of the Proposed Development to site panels and other above ground infrastructure so that they will not affect views in which the church is appreciated, the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
Church of All Saints (NHLE 1254135)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the design of the Proposed Development to site panels and other above ground infrastructure so that they will not affect views in which the church is appreciated, the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Blankney Park (non-designated park and garden Lincs HER reference MLI82759)	Construction and operation	No physical impacts are predicted as this asset is outside the Site. Due to the design of the Proposed Development to site panels and other above ground infrastructure so that they will not affect views in which former park is appreciated, the contribution of setting to the significance of this asset will be unaffected by the Proposed Development and it is sufficiently removed from the Site that noise, dust etc. during construction will not lead to significant effects.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor has now been considered. However, the Applicant is of the opinion that this receptor does not need to be considered for further assessment for the reasons outlined in the 'Justification' column.
The setting of all heritage assets	Decommissioning	The effects of decommissioning activities on the setting of heritage assets will be similar to those during construction and will reverse the operational phase setting effects. Any negative effects are therefore considered to be not significant.	No change – this matter was proposed to be scoped out of further assessment within the EIA Scoping Report but the Scoping Opinion has requested that decommissioning effects be scoped in on the basis that assets avoided or protected in situ during construction may be under threat from disturbance or destruction during decommissioning. However, the Applicant is of the opinion that this matter should remain scoped out of further assessment for the reasons outlined in the 'Justification' column.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Below ground archaeological remains	Decommissioning	Measures documented within and secured by the Outline Decommissioning Environmental Management Plan will ensure that ground disturbance as a result of decommissioning activities will not be materially more than the construction phase. As the embedded and additional mitigation for below ground archaeological remains will ensure that no significant effects to below ground remains will occur during construction, there will not be significant decommissioning effects. The Proposed Development is not anticipated to result in significant soil compaction or changes to hydrology during decommissioning (refer to **Chapter 10: Land, Soils and Groundwater** and **Chapter 13: Water**).	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 further assessment for the reasons outlined in the 'Justification' column.
Scheduled remains of former villages of Brauncewell (NHLE 1018397) and Dunsby (NHLE 1013895)	Construction	The remains of Dunsby lie sufficiently far from the Site that construction phase effects will not occur. The masterplan has avoided siting infrastructure in proximity to the scheduled monument of Brauncewell, avoiding the potential for significant construction phase effects.	Change - these receptors were proposed to be scoped into further assessment within the EIA Scoping Report, but due to changes in the design of the Proposed Development since the EIA Scoping Report was submitted, they are now scoped out of further assessment (for the construction phase only) for the

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			reasons outlined in the 'Justification' column.
Scopwick and Blankney Conservation Areas	Construction	Mitigation measures documented within and secured by the Outline Construction Traffic Management Plan and the Outline Construction Environmental Management Plan will ensure that construction phase impacts on the conservation areas will be avoided.	Change – these receptors were not considered within the EIA Scoping Report, but due to changes in the design of the Proposed Development and/or additional information having been obtained since the EIA Scoping Report was submitted, they have been considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment (for the construction phase only) for the reasons outlined in the 'Justification' column.

Receptors/matters scoped into further assessment

8.2.7. **Table 8.3** 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 8.14 Receptor/matters scoped into further assessment

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Milepost 20 metres south of Ashby Lodge Farm, Grade II Listed Building (NHLE Ref: 1061824)	Construction	The mile post is located within the Site. Construction activity will therefore directly impact on this asset, with potential for significant effects to occur.	No change – this receptor was proposed to be scoped into further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Avro Lancaster crash site (Lincolnshire County Council HER Ref: MLI25416)	Construction	Although a non-designated heritage asset, military crash sites are protected by legislation. The crash site is recorded within the Site. Construction activity would directly impact on this asset, with potential for significant effects to occur.	No change – this receptor was proposed to be scoped into further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Hawker Hurricane crash site (Lincolnshire County Council HER Ref: MLI25417)	Construction	Although a non-designated heritage asset, military crash sites are protected by legislation. The crash site is recorded within the Site. Construction activity would directly impact on this asset, with potential for significant effects to occur.	No change – this receptor was proposed to be scoped into further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Scheduled remains of former	Operation	The rural setting of these assets	No change – these receptors were

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
villages of Brauncewell (NHLE 1018397) and Dunsby (NHLE 1013895)		contributes to their significance and the character of this setting could be altered by the presence of the solar farm within the wider surroundings.	proposed to be scoped into further assessment within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
Scopwick and Blankney Conservation Areas	Operation	The positive contribution of setting to the significance of these conservation areas could be affected by the Proposed Development	Change - these receptors were not considered within the EIA Scoping Report, but the Scoping Opinion has requested they be considered. Following further consideration, the Applicant agrees with this opinion.
Currently unknown below ground archaeological remains within the Site	Construction and operation	There remains potential for currently unknown remains to be present within the Site which could be impacted by the construction of the Proposed Development. The contribution of setting to the heritage significance of these assets could be impacted by the presence of the Proposed Development over or in proximity to them.	No change – this receptor 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

8.2.8. Following the guidance from Lincolnshire County Council[83], the following study areas have been used for this preliminary assessment of effects on cultural heritage assets:

- a 2km buffer from the Site boundary has been used to gather information on non-designated historic assets; and
- a buffer of up to 5km from the Site boundary, informed by the ZTV, has been used to identify designated historic assets with potential for visual change to their setting to result in harm to their significance.

8.2.9. Assets within these study areas are shown on **Figure 8.1** and **Figure 8.2**.

8.3. Legislative framework, planning policy and guidance

Relevant legislation

8.3.1. The legislative framework for the Proposed Development as a whole is detailed in **Section 1.2** of **Chapter 1**. The legislation relevant to cultural heritage comprises the following:

- Planning (Listed Buildings and Conservation Areas) Act 1990 (excluding normal planning procedures, which are disapplied by the Development Consent Order (DCO) and the related authorisation process, which if granted, would encompass all of the normal consents required to authorise a project).
- Ancient Monuments and Archaeological Areas Act 1979 (as amended) (excluding normal planning procedures, which are disapplied by the DCO and the related authorisation process which, if granted, would encompass all of the normal consents required to authorise a project).
- Protection of Military Remains Act 1986.
- The Hedgerows Regulations 1997.

8.3.2. Other heritage legislation that may be relevant to the potential for undiscovered remains comprises:

- Treasure Act 1996; and
- Burial Act 1857.

Relevant planning policy

8.3.3. Planning policy relevant to cultural heritage comprises the following:

[83] Lincolnshire County Council "Guidance for large schemes including NSIPs and EIAs, General Scoping Opinion for the Historic Environment" supplied by Jan Allen via email 07/10/2022

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)[84] provides the basis for decisions regarding nationally significant energy infrastructure. Section 5.8 refers to the significance, impact and recording of the historic environment.
- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[85] - Section 5.9 refers to the significance, impact and recording of the historic environment. - paragraph 3.10.101 refers to the positive impacts that solar developments can have on the historic environment by removing areas from regular ploughing; paragraph 3.10.106 notes that evaluation should be proportionate to the sensitivity and extent of proposed ground disturbance.
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[86] which makes reference to the need to consider whether the substantial public benefits of large-scale renewable projects would outweigh any loss or harm to the significance of a designated heritage asset.
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[87] - Section 3.10 gives specific consideration to solar development including assessment of heritage impacts.
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2011)[88]. Paragraph 2.8.9 refers to the environmental and archaeological consequences of underground cabling and paragraph 1.7.5 considers effects on archaeology.
- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023)[89]. Paragraph 2.9.25 makes reference to consideration of designated heritage assets and disruptive effects of undergrounding on archaeological and heritage sites.

[84] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[85] 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
[86] National Policy Statement for Renewable Energy Infrastructure (EN-3) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[87] Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements
[88] National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011). Available online: 1942-national-policy-statement-electricity-networks.pdf (publishing.service.gov.uk)
[89] Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023). Available online: EN-5 Electricity Networks National Policy Statement (publishing.service.gov.uk)

- Central Lincolnshire Local Plan 2018-2040[90], comprises Policy S14: Renewable Energy (in so far as it includes reference to heritage assets) and Policy S57: The Historic Environment.
- National Planning Policy Framework (NPPF) (September 2023)[91], Paragraphs 189, 194, 200, 202, 203, 206.

Applicable guidance

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

- Lincolnshire County Council's Guidance for large schemes including NSIPs and EIAs, General Scoping Opinion for the Historic Environment[92];
- Chartered Institute for Archaeologists' Standard and Guidance for Historic Environment Desk-Based Assessment[93];
- Chartered Institute for Archaeologists' Code of Conduct[94]
- Historic England Guidance on The Setting of Heritage Assets[95] (Historic Environment Good Practice Advice in Planning GPA3);
- Historic England Guidance on Statements of Heritage Significance: Analysing Significance in Heritage Assets (Historic England Advice Note 12)[96];
- Historic England Guidance on Managing Significance in Decision Taking (Historic Environment Good Practice Advice in Planning GPA2)[97];
- Historic England Guidance on Commercial Renewable Energy Development and the Historic Environment (Historic England Advice Note 15)[98]; and
- Institute of Environmental Management and Assessment, Institute of Historic Building Conservation and Chartered

[90] https://www.n-kesteven.gov.uk/planning-building/planning/planning-policy/central-lincolnshire-local-plan-2018-2040
[91] https://www.gov.uk/government/publications/national-planning-policy-framework--2
[92] Lincolnshire County Council "Guidance for large schemes including NSIPs and EIAs, General Scoping Opinion for the Historic Environment" supplied by Jan Allen via email 07/10/2022
[93] CIfAS&GDBA_4.pdf (archaeologists.net)
[94] CIfA Code, regulations and standards & guidance | Chartered Institute for Archaeologists
[95] The Setting of Heritage Assets (historicengland.org.uk)
[96] Statements of Heritage Significance: Analysing Significance in Heritage Assets (historicengland.org.uk)
[97] Managing Significance in Decision-Taking in the Historic Environment (historicengland.org.uk)
[98] Commercial Renewable Energy Development and the Historic Environment | Historic England

Institute for Archaeologists' "Principles of Cultural Heritage Impact Assessment in the UK"[99].

8.4. Methodology

Data sources to inform baseline characterisation

8.4.1. The following sources of information have been used to inform this preliminary assessment:

- Information on designated heritage assets from the National Heritage List for England, downloaded on 15 June 2023;
- Data on heritage assets and previous archaeological investigations from the Lincolnshire HER, obtained as a digital data extract on 23 August 2022;
- Historical Ordnance Survey mapping;
- Environment Agency LiDAR data;
- Information on designated heritage assets from the National Heritage;
- Aerial photographs held by Historic England Archives, Lincolnshire HER and Cambridge University Collection of Aerial Photography;
- Maps and other relevant primary and secondary sources held in Lincolnshire archives;
- Portable Antiquities Scheme data; and
- Geophysical survey results.

Surveys to inform baseline characterisation

8.4.2. The following surveys have been undertaken to inform this preliminary assessment:

- Field visits to the Site to confirm the condition and location of previously recorded assets, examine potential assets identified through desk-based research and to check for currently unrecorded assets;
- Geophysical survey (refer to **Appendix 8.3**); and
- Baseline setting visits to designated and non-designated assets.

Design assumptions

8.4.3. **Chapter 2: Description of the Proposed Development** details the preliminary design principles of the Proposed Development

99 [redacted]

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.

8.4.4. **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.

8.4.5. For the purposes of this preliminary assessment, a reasonable worst case has also comprised an assumption that where necessary to protect archaeological remains, the mounting structure for solar arrays would be supported by concrete footings and that outside areas of archaeological sensitivity, panels would be supported by drilled cast piles, as these would cause the most ground disturbance of the other support options.

8.4.6. For the purposes of filtering assets following the Stage 1 Setting Assessment, a worst case of visibility of the Proposed Development has been based on the ZTV for the transmission towers; as the tallest element of the Proposed Development, this represents the maximum visibility of the Proposed Development and has scoped out the fewest assets from further assessment. The transmission towers have been included as part of the Proposed Development for the purposes of this preliminary assessment.

Embedded mitigation measures

8.4.7. 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. 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**.

8.4.8. Those embedded mitigation measures relevant to this preliminary cultural heritage assessment include project principals 2.4 'Conserve the significance of heritage assets including Scopwick Mill and Ashby Walled Gardens' and 2.5 'Protect the setting of the Scopwick and Blankney Conservation Areas'. The masterplan has avoided siting panels and other infrastructure in locations that would

impact on the contribution of setting to the significance of these assets.

Assessment methodology

8.4.9. 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.

Importance of cultural heritage assets

8.4.10. The importance of a cultural heritage asset is a measure of the degree to which the heritage significance ("the value of a heritage asset to this and future generations because of its heritage interest" [100]) of that asset is sought[101]. The level of importance will therefore reflect any statutory and non-statutory heritage designation or, in the case of undesignated assets, the professional judgement of the assessor as to the degree of importance that the asset has with reference to regional research frameworks.

8.4.11. The criteria presented in **Table 8.4** have been used to establish the importance of cultural heritage assets. In the absence of directly applicable guidance for England, these criteria have been derived from the guidance produced by Scottish Natural Heritage and Historic Environment Scotland[102].

Table 8.4 Criteria for establishing importance of heritage assets

Importance	Description of receptors
Very High	World heritage sites; assets of acknowledged international importance; assets that can contribute significantly to acknowledged international research objectives; Historic landscapes of international value (designated or not) and extremely well preserved historic landscapes with exceptional coherence, time depth or other critical factor(s).
High	Scheduled monuments and non-designated assets of schedulable quality and importance; Grade I and II* listed buildings and Grade II listed buildings that can be shown to have exceptional qualities in their fabric or associations; Conservation Areas with exceptional qualities; non-designated structures of clear national importance; designated and non-designated historic landscapes of historic interest; assets that

[100] " NPPF 2021 Annex 2: Glossary
[101] IEMA, IHBC and CIfA (2021) Principles of Cultural Heritage Impact Assessment in the UK
[102] Scottish Natural Heritage & Historic Environment Scotland (2018) *Environmental Impact Assessment Handbook Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.*

Importance	Description of receptors
	can contribute significantly to acknowledged national research objectives.
Medium	Grade II listed buildings; Non-designated assets that contribute to regional research objectives; Locally listed buildings and other historic unlisted buildings that have exceptional qualities; Conservation Areas.
Low	Non-designated assets of local importance including those compromised by poor preservation; assets of limited value but with the potential to contribute to local research objectives; robust non-designated historic landscapes.
Negligible	Assets with very little surviving archaeological interest; buildings of little architectural or historic note; landscapes with little historic interest

Magnitude of Impact

8.4.12. The magnitude of impact reflects the scale of change which would be caused by the Proposed Development and the effect this would have on the ability to interpret significance and appreciate the historic asset. Impacts can result either from physical changes to a historic asset or through sensory changes within its setting.

8.4.13. An impact may be positive where for example, as part of the Proposed Development, an intrusive building or feature is removed or replaced with a more harmonious one; historic features are restored or revealed; a new feature is added which adds to public appreciation; new views are introduced that add to public experience of an asset; or public interpretation or access is improved to an asset or its setting.

8.4.14. Impacts may impart major change, for example where groundworks completely destroy important archaeological remains, to minor change to part of a historic asset's setting, leading to a limited impact on our ability to interpret it, or its context.

8.4.15. Utilising the key principles for assessing the implications of change outlined above, an assessment of the magnitude of impact has been undertaken using the criteria presented in **Table 8.5** below. As noted above at **paragraph 8.4.11**, due to a lack of directly comparable guidance for England, these criteria have been derived

from the guidance produced by Scottish Natural Heritage and Historic Environment Scotland[103].

8.4.16. Conclusions on the assessed magnitude of impact are a product of the consideration of the elements of an asset and its setting that contribute to its heritage significance and the degree to which the Proposed Development would change these contributing elements. The assessment therefore reflects the varying degrees of sensitivity of different assets to change brought about by different types of development.

8.4.17. This definition of magnitude and assessment methodology applies to likely significant effects resulting from change in the setting as well as likely physical effects on the fabric of an asset.

Table 8.5 Criteria for classifying magnitude of impact

Impact magnitude	Criteria
Major	Change to key historic building elements so that an asset is totally altered; OR change to most/all key archaeological materials such that the resource is totally altered; OR comprehensive change to the setting such that the significance of the asset is severely compromised
Moderate	Change to many key historic building elements, such that the asset is significantly modified; changes to many key archaeological materials such that the resource is clearly modified; changes to setting of an asset, such that the significance of the asset is compromised
Minor	Change to key historic building elements, such that the asset is slightly different; changes to key archaeological materials such that the asset is slightly altered; changes to setting of an historic building, such that its significance is slightly compromised
Negligible	Very minor changes to historic building elements, archaeological materials or setting that hardly affect them/it
No Change	No change to fabric, archaeological materials or setting

Significance of Effect

8.4.18. The assessment of effects combines analysis of the data gathered during the desk-based assessment, site visit and ZTVs of the Proposed Development.

[103] Scottish Natural Heritage & Historic Environment Scotland (2018) Environmental Impact Assessment Handbook Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.

8.4.19. This preliminary assessment has been carried out using professional judgement, taking into account designations and heritage significance as assessed against national standards. Significance of effect is based on a combination of the importance of the receptor and the magnitude of impact. The significance of effect matrix is presented in **Table 8.6** below and provides a guide to decision-making but is not a substitute for professional judgement and interpretation, particularly where the importance or magnitude of impact are not clear or are borderline between categories. These criteria have been derived from the guidance produced by Scottish Natural Heritage and Historic Environment Scotland[104].

8.4.20. Major and moderate effects are regarded as significant, while minor and negligible effects are regarded as not significant.

Table 8.6 Criteria for Assessing the Significance of Effect

Magnitude of impact	Importance of receptor				
	Negligible	**Low**	**Medium**	**High**	**Very High**
Major	Minor	Moderate	Moderate	Major	Major
Moderate	Negligible	Minor	Moderate	Moderate	Major
Minor	Negligible	Negligible	Minor	Minor	Moderate
Negligible	Negligible	Negligible	Negligible	Minor	Minor
None	No effect	No effect	No effect	No effect	No effect

8.5. Summary of baseline conditions

8.5.1. Full details of the baseline are provided in the Archaeological DBA (**Appendix 8.1**), Aerial Investigation and Mapping Report (**Appendix 8.2**) and the Geophysical Survey Report (**Appendix 8.3**).

8.5.2. With the exception of two World War II era aeroplane crash sites (Avro Lancaster crash site (Lincolnshire County Council HER Ref: MLI25416) and Hawker Hurricane crash site (Lincolnshire County Council HER Ref: MLI25417)), which being protected by legislation are considered to be of **high** importance, the non-designated heritage assets within the Site are generally considered to be of **low** importance.

8.5.3. The Grade II listed milepost on the A15 in Area A1/A2 (NHLE1061824) is of **medium** importance. The areas of high

[104] Scottish Natural Heritage & Historic Environment Scotland (2018) Environmental Impact Assessment Handbook Guidance for competent authorities, consultation bodies, and others involved in the Environmental Impact Assessment process in Scotland.

archaeological interest identified within the geophysical survey may also be of **medium** importance, as the archaeological information contained in this distribution of similar sites could contribute to regional research aims.

8.5.4. Potential currently unknown below ground archaeological remains could be of up to **high** importance but are more likely to be of up to **medium** importance if they contribute to regional research aims.

8.5.5. Beyond the Site boundary but within the 5km study area, the Scheduled remains of the former villages of Brauncewell (NHLE 1018397) and Dunsby (NHLE 1013895) are considered to be of **high** importance and the Scopwick and Blankney Conservation Areas of **medium** importance.

Sensitive receptors

8.5.6. The following sensitive receptors have been assessed:

- Milepost 20 metres south of Ashby Lodge Farm, Grade II Listed Building (NHLE Ref: 1061824) – **medium** importance.
- Avro Lancaster crash site (Lincolnshire County Council HER Ref: MLI25416) - **high** importance.
- Hawker Hurricane crash site (Lincolnshire County Council HER Ref: MLI25417) - **high** importance.
- Scheduled remains of former villages of Brauncewell (NHLE 1018397) and Dunsby (NHLE 1013895) - **high** importance.
- Scopwick and Blankney Conservation Areas - **medium** importance.
- Currently unknown below ground archaeological remains within the Site - up to **high** importance but more likely up to **medium**.

8.5.7. All key sensitive receptor locations are shown on **Figure 8.3**.

Future baseline

8.5.8. Within the Site boundary, the land would continue in arable agricultural use in the future. The types of crops grown would likely change over time depending on the landowner/tenant farmers' preference and market trends.

8.5.9. Within the Site and the surrounding area, vegetation patterns (trees, hedgerows etc.) could change as a result of additional planting, growth, disease or climate effects. This could lead to changes in the way that the known heritage assets are experienced.

8.5.10. Additional heritage assets could come to light following investigations of other sites in the study area.

8.6. Likely effects, additional mitigation and residual effects

Construction phase

Table 8.7 Assessment of likely effects, additional mitigation and residual effects during construction

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Milepost 20 metres south of Ashby Lodge Farm, Grade II Listed Building (NHLE Ref: 1061824)	Likely effects	The milepost could be damaged through construction activity.
	Additional (secondary and tertiary) mitigation	The milepost will be clearly demarcated in advance of construction so that it can be avoided. Tool box talks will be given to ensure that all contractors are aware of the listed structure.
	Likely residual effects	The milepost is an asset of **medium** importance. The magnitude of impact, following the implementation of additional mitigation measures, is expected to be **negligible**. Therefore, there is likely to be a **negligible adverse** residual effect, which is considered to be **not significant**.
Avro Lancaster crash site (Lincolnshire County Council HER Ref: MLI25416) Hawker Hurricane crash site (Lincolnshire County Council HER Ref: MLI25417)	Likely effects	Disturbance or damage through construction activity – piling for solar array supports; excavation for cables; topsoil stripping for compounds, substations, inverter/transformer stations, battery energy storage systems etc. where any remains are within the footprint of the proposed construction.
	Additional (secondary and tertiary) mitigation	A programme of metal detecting and/or fieldwalking to identify any remains of the crash will be documented within and secured by the Outline Construction Environmental Management Plan, and in accordance with a licence from the Joint Casualty and Compassionate Centre, will ensure that disturbance of any remains can

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		be either avoided through the detailed design of the Proposed Development or the effects offset by archaeological recording and return of remains to the Ministry of Defence.
	Likely residual effects	The Avro Lancaster crash site and the Hawker Hurricane crash site are of **high** importance. The magnitude of impact, following the implementation of additional mitigation measures, is expected to be **minor**. Therefore, there is likely to be a **minor adverse** residual effect, which is considered to be **not significant**.
Currently unknown below ground archaeological remains within the Site	Likely effects	Disturbance or damage through construction activity – piling for solar array supports; excavation for cables; topsoil stripping for compounds, substations, inverter/transformer stations, battery energy storage systems etc. where the archaeological remains are within the footprint of the proposed construction.
	Additional (secondary and tertiary) mitigation	A programme of archaeological investigation will be secured as part of the DCO. Where the investigation finds that currently unknown archaeological remains are present within the solar array areas and are of such importance as to merit preservation in situ, mitigation will take the form of limiting the ground disturbance in these areas through the construction methods (e.g., use of concrete pad foundations and altering the routes of cables or limiting the depth of excavation for the cables). Where currently unknown archaeological remains are found to

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		be present within the areas of substations, collector compounds, transformer/inverter stations and these cannot be micro-sited to areas without archaeological remains the effects will be off set through a programme of archaeological investigation, recording and reporting.
	Likely residual effects	Currently unknown remains could be of up to **high** importance (though more likely up to **medium**). The magnitude of impact, following the implementation of additional mitigation measures, is expected to be **minor**. Therefore, there is likely to be a **minor adverse** residual effect, which is considered to be **not significant**.

Operational phase

Table 8.8 Assessment of potential effects, additional mitigation and residual effects during operation (including maintenance)

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Scheduled remains of former village of Brauncewell (NHLE 1018397)	Likely effects	Changes to the setting of this asset could result in harm to its significance.
	Additional (secondary and tertiary) mitigation	In addition to embedded mitigation through the layout of the Proposed Development, additional hedgerow planting will screen the panels from the scheduled monument.
	Likely residual effects	The importance of the receptor is **high** and the magnitude of impact, following the implementation of additional mitigation measures, is expected to be **minor**. Therefore, there is likely to be a **minor adverse** residual effect, which is considered to be **not significant**.

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Scheduled remains of former village of Dunsby (NHLE 1013895)	Likely effects	Changes to the setting of this asset could result in harm to its significance.
	Additional (secondary and tertiary) mitigation	In addition to embedded mitigation through the layout of the Proposed Development, additional hedgerow planting will screen the panels from the scheduled monument.
	Likely residual effects	The importance of the receptor is **high** and the magnitude of impact, following the implementation of additional mitigation measures, is expected to be **minor**. Therefore, there is likely to be a **minor adverse** residual effect, which is considered to be **not significant**.
Scopwick Conservation Area	Likely effects	Changes to the setting of this asset could result in harm to its significance.
	Additional (secondary and tertiary) mitigation	In addition to embedded mitigation through the layout of the Proposed Development, additional hedgerow planting will screen the panels from the conservation area.
	Likely residual effects	The importance of the receptor is **medium** and the magnitude of impact, following the implementation of additional mitigation measures, is expected to be **minor**. Therefore, there is likely to be a **minor adverse** residual effect, which is considered to be **not significant**.
Blankney Conservation Area	Likely effects	Changes to the setting of this asset could result in harm to its significance.
	Additional (secondary and tertiary) mitigation	In addition to embedded mitigation through the layout of the Proposed Development, additional hedgerow

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		planting will screen the panels from the conservation area.
	Likely residual effects	The importance of the receptor is **medium** and the magnitude of impact, following the implementation of additional mitigation measures, is expected to be **minor**. Therefore, there is likely to be a **minor adverse** residual effect, which is considered to be **not significant**.
Currently unknown below ground archaeological remains within the Site	Likely effects	If these remains exist and derive significance from their setting, then the change of land use within the Site could result in harm to this significance. The effects could be significant if assets are of high importance.
	Additional (secondary and tertiary) mitigation	Impacts could be reduced or avoided through changes to the layout of the Proposed Development by micrositing, or use of other mitigation during construction or could be off set through additional research and interpretation.
	Likely residual effects	The importance of these receptors is unknown and could be up to **high** (though more likely no more than **medium**). Following the implementation of additional mitigation, the magnitude of impact is expected to be up to **minor**. Therefore, there is likely to be at most a **minor adverse** residual effect which would be **not significant**.

Assessment against future baseline

8.6.1. As the future baseline setting of assets is unquantifiable, a future baseline has not been assessed.

8.7. Opportunities for environmental enhancement

8.7.1. Further interpretation of the archaeological resource within the Site could be an enhancement opportunity by increasing public understanding and awareness of the heritage resource.

8.8. Intra-project combined effects

8.8.1. 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 cultural heritage assessment. This could include impacts on listed buildings (for example, pollution or dust may impact on the historic fabric of listed buildings, and listed buildings may be residential properties where residents may be impacted by amenity) and conservation areas (within which residential properties where residents may be impacted by amenity). The intra-project combined effects will be presented within the ES once relevant assessments are further progressed.

8.8.2. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

8.9. Difficulties and uncertainties

8.9.1. Geophysical survey cannot detect all below ground archaeological remains. A programme of archaeological deposit modelling will be carried out to further understand the reasons for a large area of apparently blank results in the west of the Site. Following this a proportionate strategy of further evaluation through trial trenching will be developed to inform the determination of the DCO application.

8.9.2. Assessment of the baseline setting of heritage assets has been carried out from publicly accessible locations informed by satellite imagery, historic aerial photographs, historic and current mapping. Where the initial assessment has identified the potential for private views to contribute to the significance of the asset, the desk-based and publicly accessible information has been used to assess a worst case scenario.

8.10. Further work to inform the ES

8.10.1. Geophysical survey of the Grid Connection Corridor will be undertaken in 2024.

8.10.2. A deposit model of the Site will be prepared using existing geotechnical data. If necessary, this will be refined through further

fieldwork. The deposit model will inform the understanding of the likelihood of currently unknown archaeological remains within the Site.

8.10.3. The results of the deposit model will inform the development of a proportional level of further evaluation through trial trenching to inform the determination of the DCO. It is proposed that this would be focused on the areas of the Proposed Development with the greatest potential to impact on below ground archaeological remains: BESS, Collector Compounds, and Springwell Substation.

9. Landscape and Visual

9.1. Introduction

9.1.1. This chapter presents the preliminary environmental information relating to the Proposed Development in terms of the landscape resource and visual amenity. It also reports a preliminary assessment of the potential likely significant environmental effects arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development on landscape and visual receptors.

9.1.2. This preliminary assessment considers the baseline and potential effects upon:

- landscape fabric;
- landscape character;
- the special qualities of any landscape designations; and
- visual receptors including residential, transport and recreational receptors.

9.1.3. This preliminary assessment has been prepared in accordance with the principles established in published best practice, namely the Guidelines for Landscape and Visual Impact Assessment[105] (GLVIA3) and associated technical guidance notes including those published by the Landscape Institute (referenced as appropriate – see **Section 9.3**). This preliminary assessment, however, is not intended to constitute a full Landscape and Visual Impact Assessment (LVIA), as insufficient detail is currently available to complete such an assessment. This preliminary assessment is based on the parameter plans presented in **Figures 2.4, 2.5 and 2.6** of **Volume 2**; a full LVIA will be presented in the subsequent ES based on the proposals comprising the DCO application.

9.1.4. Although linked, landscape and visual effects are considered separately. Landscape effects derive from changes in the landscape fabric, which may result in changes to landscape character, whereas visual effects are the effects of these changes as experienced by people (visual receptors).

9.1.5. In considering effects on landscape fabric, this preliminary assessment considers the removal or addition of elements such as vegetation in relation to landscape change, but the assessment of

[105] Guidelines for Landscape and Visual Impact Assessment (3rd Edition), 2013, Landscape institute and IEMA

effects of the Proposed Development on ecological receptors is considered in **Chapter 6: Biodiversity**.

9.1.6. Likewise, this preliminary assessment considers cultural heritage assets in so much as they contribute to landscape character and its perceived value (for example, Conservation Areas are treated as areas where the character and views are valued). However, the assessment of effects of the Proposed Development on cultural heritage receptors is considered in **Chapter 8: Cultural Heritage**.

9.1.7. The potential effects of glint and glare arising from the Proposed Development are addressed separately in **Chapter 14: Glint and Glare**.

9.1.8. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR) with particular reference to the following appendices in **Volume 3**:

- **Appendix 9.1** - LVIA Methodology and Assessment Criteria
- **Appendix 9.2** - Extracts from Published Landscape Character Assessments
- **Appendix 9.3** – Landscape Sensitivity Appraisal
- **Appendix 9.4** – Preliminary Viewpoint Analysis
- **Appendix 9.5** - Summary of Residential Amenity Assessment Work Undertaken to Date

9.1.9. Figures referred to in this chapter can be found in **Volume 2,** and the visualisations can be found in **Volume 4**.

9.2. Consultation, scope and study area

Consultation undertaken to date

9.2.1. An EIA Scoping Report, presented in **Appendix 4.1**, setting out the proposed scope and methodology for the proposed LVIA, was submitted to the Planning Inspectorate in March 2023. A Scoping Opinion, presented 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 landscape and visual matters in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

9.2.2. Subsequent consultation has taken place with North Kesteven District Council and Lincolnshire County Council. The district and county councils jointly appointed an external landscape consultant (AAH Consultants) to provide landscape and visual advice and act on their behalf in terms of landscape and visual matters. Therefore, consultation with North Kesteven District Council and Lincolnshire County Council has taken place primarily through AAH Consultants.

9.2.3. **Table 9.1** provides a summary of the consultation activities undertaken in support of the preparation of this preliminary assessment, in addition to the EIA Scoping process.

Table 9.15 Summary of consultation undertaken

Consultee	Key matters raised	Actions in response to consultee comments
North Kesteven District Council/ Lincolnshire County Council	Following EIA Scoping, an initial meeting was held with North Kesteven District Council, Lincolnshire County Council and their retained landscape consultant from AAH Consultants on 1st June 2023. During the meeting introductions were made; an update on the project was provided; project design principles were introduced; an overview was provided of LVIA studies undertaken to date; and certain aspects of the proposed LVIA methodology were discussed.	It was agreed that the study area would be kept under review depending on how the project evolved and the final study area for the LVIA presented in the ES would be reviewed before DCO application submission to confirm it is appropriate and robust. A summary of further discussions with North Kesteven District Council/Lincolnshire County Council on the study area is set out in **paragraph 9.2.11** below. It was agreed that the operational effects of the Proposed Development would be considered in year 1 post construction and also in year 10 post construction once mitigation has become established. It was noted that there was a small number of locations where the ZTV (Zone of Theoretical Visibility) indicated a very small area of visibility within the Lincoln Cliff Area of Great Landscape Value (AGLV). It was agreed that the Applicant would review these locations in the field and provide further justification for scoping out the AGLV as necessary. This has subsequently been completed and a further justification for scoping out the AGLV is provided in **Table 9.2** below.

Consultee	Key matters raised	Actions in response to consultee comments
		It was agreed that the Applicant would review in the field the locations where the ZTV indicated a very small area of visibility within the Lincoln Cliff character area and provide justification for its exclusion as necessary. This has subsequently been completed and a further justification for scoping out the character area is provided in **Table 9.2** below. It was confirmed that a Residential Visual Amenity Assessment would be undertaken and presented in the ES. A summary of the residential visual amenity assessment work undertaken to date is presented in **Appendix 9.5** and will be updated in the ES. It was agreed that the Applicant would issue a shortlist of potential LVIA assessment viewpoints for inclusion in the ES to AAH Consultants and then meet on site to review these together. The shortlist was subsequently sent to North Kesteven District Council /Lincolnshire County Council on 10th June 2023 with a list of 46 potential assessment viewpoints for consideration and comment (see subsequent rows of this table for resolution of viewpoint selection).
North Kesteven District Council/ Lincolnshire County Council	The above meeting and viewpoint shortlist was followed by a joint site visit on 13th June 2023 attended by the Applicant and AAH Consultants.	Various locations were visited and the landscape consultant from AAH Consultants followed up the joint site visit with further field analysis alone.

Consultee	Key matters raised	Actions in response to consultee comments
North Kesteven District Council/ Lincolnshire County Council	On 29th June 2023, a technical memorandum prepared by AAH Consultants was sent to the Applicant with preliminary comments on the shortlist of assessment viewpoints plus some additional suggested viewpoints. A meeting was then held on 3rd July 2023 between the Applicant and AAH Consultants to review the proposed viewpoint selection and look at the baseline photography from potential viewpoint locations.	During the meeting a further update on the project was provided to AAH Consultants. The shortlist of viewpoints was reviewed with reference to baseline photographs where these had already been taken. Potential additional locations suggested by AAH Consultants in the memorandum issued on 29th June were also considered. It was agreed that some of the viewpoints in the shortlist issued by the Applicant to AAH Consultants following the previous meeting could be removed from the list whilst a number of others were identified for inclusion. The Applicant agreed to update the schedule of proposed viewpoints and to reissue it to North Kesteven District Council/Lincolnshire County Council for approval as a final proposed viewpoint selection.
North Kesteven District Council/ Lincolnshire County Council	Following the meeting on 3rd July 2023, the Applicant wrote to AAH Consultants and North Kesteven District Council/Lincolnshire County Council on 17th July 2023 with a final proposed list of assessment viewpoints for agreement.	AAH Consultants responded on behalf of North Kesteven District Council /Lincolnshire County Council by means of a technical memo dated 15th August 2023 confirming that the viewpoints proposed were considered acceptable and that no additional viewpoints were required (subject to any changes in the parameters on which they had been consulted). Annotated baseline photographs from the agreed viewpoints are presented in **Volume 4** of this PEIR.

Scope of the assessment

9.2.4. The scope of this preliminary assessment has been established taking account of the Scoping Opinion, presented in **Appendix 4.2**, and has been refined through ongoing consultation with North Kesteven District Council/Lincolnshire County Council as encouraged in the landscape and visual specific comments provided by PINS in Section 3.5 (ID 3.5.8) of the Scoping Opinion. In relation to landscape and visual matters, the EIA Scoping Report, presented in **Appendix 4.1**, proposed certain receptors to be scoped out of the assessment and others to be scoped in. In some cases, PINS agreed with the proposed scope whilst, in other instances, PINS requested that the scope be reviewed as the project progressed in consultation with relevant stakeholders; primarily North Kesteven District Council and Lincolnshire County Council. A detailed response to the Scoping Opinion is presented in **Appendix 4.3**. PINS ID 3.5.8 and ID 3.5.9 are addressed in **Appendix 4.3** as they do not concern matters that the Applicant sought to either scope in or out of the LVIA but are more generic comments about the study area and mitigation. The study area for the LVIA is addressed more fully at **paragraphs 9.2.8 to 9.2.17** below. Detailed mitigation proposals will be developed as the project progresses towards DCO submission and will be reported fully in the ES, but embedded mitigation measures already established are outlined in **paragraph 9.4.14** below.

9.2.5. 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

9.2.6. **Table 9.2** 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 9.16 Receptors/matters scoped out of further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Lincolnshire Wolds AONB	Construction, operation and decommissioning	This AONB is situated over 20km from the Site and there would be no intervisibility at this distance.	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion agreed with this approach. (ID 3.5.1)

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Lincoln Cliff AGLV	Construction, operation and decommissioning	The AGLV is a west facing scarp slope, orientated north-south and located over 3km to the west of the Site.	No change – this receptor was proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion agreed with this approach but requested that it be demonstrated there is *'no intervisibility with reference to photos from field work or other appropriate evidence'* (ID 3.5.2). The ZTVs presented in **Figures 9.5 to 9.8** demonstrate that visibility of the solar module, BESS and Springwell Substation would not extend to the AGLV. Refer to **Appendix 4.3** for further justification and details of discussions with North Kesteven District Council/Lincolnshire County Council in this regard.
Other landscape character areas (LCAs) in the North Kesteven Landscape Character Assessment	Construction, operation and decommissioning	Despite the fact that the ZTVs indicate some distant visibility from other LCAs, field work has established that there would be no intervisibility between the Site and any other LCAs.	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion agreed with this approach, but requested the '*ZTV should be reviewed with the final scheme and presented in the ES to demonstrate that there is no intervisibility'* (ID 3.5.3). The ZTVs presented in **Figures 9.5 to 9.8** demonstrate that there would be negligible visibility

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			of the Proposed Development from any LCAs other than the two host LCAs discussed in this chapter. Refer to **Appendix 4.3** for further. justification and details of discussions with North Kesteven District Council/Lincolnshire County Council in this regard.
View from villages/ hamlets of Metheringham, Bloxham, Digby, Dorrington, Ruskington, Leasingham, Cranwell, RAF Cranwell, Wellingore and Navenby and other settlements along the A607	Construction, operation and decommissioning	Despite the fact that the ZTVs indicate some distant visibility in some cases from the edges of these villages, once intervening hedgerows and other vegetation is taken into account, it is highly unlikely there would be any views of the Proposed Development from these settlements. Any glimpses would be distant, filtered and negligible.	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report and PINS responded that the '*ES should demonstrate there is no intervisibility, otherwise the potential effects on views and visual amenity within the ZTV where significant effects are likely to occur should be assessed*.' (ID 3.5.4) The ZTVs presented in **Figures 9.5 to 9.8** demonstrate that there would be negligible visibility of the Proposed Development from any of these villages. Refer to **Appendix 4.3** for further justification and details of discussions with North Kesteven District Council/Lincolnshire County Council in this regard.
PRoW and local roads beyond	Construction	It is unlikely that there would be any views of the	No change – these receptors were proposed to be scoped out of further

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
3km from the Site		Proposed Development at this distance, but any glimpses of the Site beyond this distance are not likely to result in effects which would reach the threshold of a significant effect.	assessment within the EIA Scoping Report and the Scoping Opinion agreed with this approach. (ID 3.5.5)
Isolated residential properties over 1km from the Site	Construction, operation and decommissioning	Whilst there may be glimpses from individual properties beyond 1km of the Site, this will be a matter of private visual amenity and under no circumstances would this give rise to an overbearing effect on residential amenity.	No change - these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report, but the Scoping Opinion stated that there was insufficient information available and the Inspectorate was '*unable to scope out this matter at this stage*'. (ID 3.5.6) For clarification, the visual effects on residential receptors across the full extent of the study area (including those beyond 1km) are considered in the assessment of landscape and visual effects presented in this preliminary assessment and will also be assessed in the ES. However, a detailed Residential Visual Amenity Assessment will only be presented in the ES for the properties identified in **Appendix 9.5,** all of which lie within 1km of any new infrastructure. Further

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			justification for this approach is set out in this appendix.
Users of the rail network, specifically section between Metheringham and the level crossing on the B1191	Construction, operation and decommissioning	Medium/Low sensitivity receptor which would have both direct and intermittent views of activity during construction, operation and decommissioning. The potential for significant effects to occur is considered low.	No change – these receptors were proposed to be scoped out of further assessment within the EIA Scoping Report and the Scoping Opinion agreed with this approach. (ID 3.5.7)

Receptors/matters scoped into further assessment

9.2.7. **Table 9.3** presents the receptors/matters that are scoped in for 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 9.17 Receptors/matters scoped into further assessment

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Landscape Character Area 7 (LCA 7): Limestone Heath (North Kesteven Landscape Character Assessment)	Construction, operation and decommissioning	Springwell West and Springwell Central fall within this LCA and there would be a large scale of change in localised parts of this LCA.	No change – this receptor was proposed to be scoped into further assessment within the EIA Scoping Report. The Scoping Opinion did not provide comment on this receptor. As the Site is located partly within this LCA, it remains scoped into further assessment and is addressed further in **Section 9.5**.

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Landscape Character Area 11 (LCA 11): Central Clays and Gravels (North Kesteven Landscape Character Assessment)	Construction, operation and decommissioning	Springwell East falls within this LCA and there would be a large scale of change in localised parts of this LCA.	No change – this receptor was proposed to be scoped into further assessment within the EIA Scoping Report. The Scoping Opinion did not provide comment on this receptor. As the Site is located partly within this LCA, it remains scoped into further assessment and is addressed further in **Section 9.5**.
Users of the A15 and B1191	Construction, operation and decommissioning	A large volume of traffic passes along these two roads which have a largely open view across part of the Site. Receptors are generally not of high sensitivity but the views are likely to be experienced by large numbers of people from these two roads.	No change – these receptors were proposed to be scoped into further assessment within the EIA Scoping Report. The Scoping Opinion did not provide comment on them. As the Site would be visible from these two routes at close proximity, they remain scoped into further assessment and are addressed further in **Section 9.5**.
Users of the PRoWs and local road network which passes through and within 3km of the Site (including the Spires and Steeples Trail and the Stepping Out walks)	Construction, operation and decommissioning	Higher sensitivity receptors which may have both direct and indirect views of the Proposed Development	No change – these receptors were proposed to be scoped into further assessment within the EIA Scoping Report. The Scoping Opinion did not provide comment on them. As the ZTVs presented in **Figures 9.5 to 9.8** indicate visibility of the Site from various locations within 3km of the

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
			Site, they remain scoped into further assessment and are addressed further in **Section 9.5**. For clarification, as noted in **Section 9.2**, the study area extends to 5km from the Springwell Substation and where relevant these receptors will also be considered within this extended study area.
Residents and visitors to the villages of Scopwick, Kirkby Green, Blankney and Ashby De La Launde	Construction, operation and decommissioning	Depending on the final layout and design of the Proposed Development, there may be views of the Proposed Development from these villages, although it is intended to minimise as far as possible visual intrusion on these receptor groups.	No change – these receptors were proposed to be scoped into further assessment within the EIA Scoping Report. The Scoping Opinion did not provide comment on them. The preliminary results of ongoing studies suggest that visual effects from these villages would be minimal. In order to consider all locations within these villages and as they are the nearest settlements to the Proposed Development, they remain scoped in and are addressed further in **Section 9.5**.
Residents of the barracks at RAF Digby	Construction, operation and decommissioning	Depending on the final layout and design of the Proposed Development, there may be views of the Proposed Development from the	No change – these receptors were proposed to be scoped into further assessment within the EIA Scoping Report. The Scoping Opinion did not provide comment on them. As there remains the possibility of open views from these

Receptor/matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		residential quarters of the barracks, although it is intended to minimise as far as possible visual intrusion on this receptor group.	receptors, they remain scoped in and are addressed further in **Section 9.5**.
Isolated farmsteads and residential properties within 1km of the Site	Construction, operation and decommissioning	Higher sensitivity receptors – consideration will be required of residential visual amenity	No change – these receptors were proposed to be scoped into further assessment within the EIA Scoping Report. The Scoping Opinion did not provide comment on them. For clarification, the visual effects on residential receptors across the full extent of the study area (including those beyond 1km) are considered in the assessment of landscape and visual effects presented in this preliminary assessment and will also be assessed in the ES. However, a detailed Residential Visual Amenity Assessment will only be presented in the ES for the properties identified in **Appendix 9.5,** all of which lie within 1km of any new infrastructure. Further justification for this approach is set out in this appendix.

Extent of the study area

9.2.8. GLVIA3 recommends that the study area for consideration of landscape effects should *'include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner'* (paragraph 5.2). It also recommends that LVIA should consider the area from which the proposed development will potentially be visible but that the emphasis '*must be on a reasonable approach which is proportional to the scale and nature of the proposed development'* (paragraph 6.2).

9.2.9. The EIA Scoping Report proposed that the LVIA study area extend up to 3km from the Site boundary of the Proposed Development and extend up to 5km from the National Grid Navenby Substation (which no longer forms a part of the Proposed Development) and the Springwell Substation.

9.2.10. The Scoping Opinion stated: *'The Scoping Report paragraph 6.5.2 proposes that the LVIA study area will be within 3km of the site boundary of the Proposed Development and extended to 5km for the National Grid and Project Substation and National Grid connecting towers. However, the full extent of potential visibility of the Proposed Development is not yet fully known and the ZTV mapping contained within Appendix F identified potential visibility beyond these extents. The ES should justify the extent of the study area/s with reference to recognised professional guidance and the extent of the likely impacts, informed by fieldwork and relevant models or approaches such as the ZTV. The Applicant should agree the study areas with relevant consultation bodies.'* (ID 3.5.8)

9.2.11. Subsequently, North Kesteven District Council/Lincolnshire County Council stated in correspondence dated 15th August 2023 that: *'The proposed 3km study area is appropriate from the solar PV development and 5km from the National Grid and Project Substation and National Grid connecting towers. However, the LVIA should clearly state the justification for these study areas, and thoroughly assess and confirm no significant views are available from beyond the study area. Also, as it is not confirmed as to whether the National Grid Substation and National Grid connecting towers are to be included within the redline* [Order limits] *boundary, and if so both the final location and design of these elements, and the Project Substation, is yet to be confirmed, therefore while every effort has been made to accommodate this with the viewpoint selection, additional viewpoints and extension of the 5km study area may be required subject to confirmation of these aspects.'*

9.2.12. It should be noted that the National Grid Substation and National Grid connecting towers no longer form part of the Proposed Development. Updated ZTVs have been prepared for the remaining elements of the Proposed Development and these are presented in

Figures 9.5 to 9.8. They are based on an offset radius of 3km from any solar PV development and 5km from any structures up to 12m in height. **Figures 9.6 to 9.8** specifically illustrate the screening effect of vegetation (including hedgerows) with distance from the Site.

9.2.13. **Figures 9.6 to 9.8** demonstrate that beyond 3km/5km respectively, there would be barely any 'theoretical' visibility of the structures up to 12m in height including the Springwell Substation. These ZTVs have been extensively tested in the field and 'ground truthed'. This fieldwork has been unable to identify any publicly accessible location where there would be any actual visibility of the structures up to 12m in height beyond these distances.

9.2.14. It is therefore considered unnecessary to extend the study area beyond 5km to include any such distant glimpses of the Proposed Development.

9.2.15. The study area for the preliminary assessment presented in this chapter has therefore been set at 3km from the Solar PV development extending where necessary to 5km from any structures up to 12m in height. The study area is illustrated on **Figure 9.1**.

9.2.16. This study area is considered proportionate and adequate to identify all non-negligible effects on landscape and visual receptors. As requested by North Kesteven District Council/Lincolnshire County Council, it will however be reviewed at ES stage to ensure that it remains appropriate in the context of the final submitted development proposals.

9.3. Legislative framework, planning policy and guidance

Relevant legislation

9.3.1. The following legislation relevant to landscape and visual matters has been reviewed and considered in respect of the Proposed Development:

- European Landscape Convention (ELC) - The ELC is an international treaty dedicated to the protection, management and planning of all landscapes in Europe signed by the UK government in 2006 and introduced in March 2007. The ELC contains 18 articles which, collectively, promote landscape protection, management and planning and organising European cooperation on landscape issues. Article 1 defines the terms used in the ELC and this chapter adopts the terminology used to define 'landscape'. Articles 5 and 6 commit signatory states to a number of actions which are designed to help ensure compliance with the overarching aims of the ELC. These include the need to recognise

landscapes in law, to establish policies aimed at landscape planning, protection and management and the integration of landscape into other policy areas. The ELC is a convention of the Council of Europe, not the EU. Therefore, Brexit does not affect the status of this convention, and at the time of writing (September 2023), the UK remains a signatory.

- Planning (Listed Building and Conservation Areas) Act 1990 - provides specific protection for buildings and areas of special architectural or historic interest. These features contribute to the heritage of an area and an understanding of historic landscape.
- The Town and Country Planning (Tree Preservation) (England) Regulations 2012 provide powers to local planning authorities to make and administer Tree Preservation Orders, the purpose of which is to protect selected trees and woodlands by prohibiting their cutting down, uprooting, topping, lopping, wilful destruction or wilful damage without prior consent.
- The Hedgerows Regulations 1997 provide protection for Important Hedgerows, these being hedgerows that meet certain criteria in respect of their length, location and importance.

Relevant planning policy

9.3.2. The following planning policies relevant to landscape and visual matters have been reviewed and considered in respect of the Proposed Development:

- Overarching National Policy Statement for Energy (NPS EN-1)[106] (2011) which provides the basis for decisions regarding nationally significant energy infrastructure;
- Draft Overarching National Policy Statement for Energy (NPS EN-1)[107] (2023 Sections 4.6 and 5.10 are of particular note;
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)[108] (2011) - Section 5.9 discusses landscape and visual matters;

[106] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: National Policy Statements for energy infrastructure - GOV.UK (www.gov.uk)
[107] Draft National Policy Statement for Energy (EN-1) (2023). Available online: Planning for new energy infrastructure: revisions to National Policy Statements - GOV.UK (www.gov.uk)
[108] National Policy Statement for Renewable Energy (EN-3) (2011). Available online: National Policy Statements for energy infrastructure - GOV.UK (www.gov.uk)

- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)[109] (2023) – Sections 3.5 and 3.10 are of particular note;
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)[110] (2011) which provides the primary basis for decisions regarding electricity networks infrastructure;
- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)[111] (2023) – Section 2.11 is of particular note;
- National Planning Policy Framework (NPPF) (September 2023) – Sections 12 and 15 are of particular note;
- Planning Practice Guidance for Natural Environment (updated July 2019);
- Planning Practice Guidance for Renewable Energy and Low Carbon Energy (updated August 2023);
- Planning Practice Guidance for Design: process and tools (updated October 2019);

9.3.3. Relevant policies of the Central Lincolnshire Local Plan 2018-2040 (Adopted in April 2023) include the following:

- Policy S5: *Development in the Countryside*, Part E indicates that proposals for non-residential development will be supported provided that the development is in line with the rural character of the location;
- Policy S14: *Renewable Energy* which provides that renewable energy schemes will be supported where relevant impacts are, or will be made, acceptable. This includes the scale, siting and design, and the consequent impacts on landscape character and visual amenity (*inter alia*);
- Policy S16: *Wider Energy Infrastructure* refers to supporting proposals in the transition to net zero. Any such proposals should mitigate any harm arising;
- Policy S66: *Trees, Woodland and Hedgerows* which indicates that development proposals should be prepared on the principle that existing trees and woodland should be

[109] Draft National Policy Statement for Renewable Energy (EN-3) (2023). Available online: Planning for new energy infrastructure: revisions to National Policy Statements - GOV.UK (www.gov.uk)
[110] National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011). Available online: National Policy Statements for energy infrastructure - GOV.UK (www.gov.uk)
[111] Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023). Available online: Planning for new energy infrastructure: revisions to National Policy Statements - GOV.UK (www.gov.uk)

maintained, improved and expanded. Existing hedgerows are expected to be retained where appropriate.

Applicable guidance

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

- Guidelines *for Landscape and Visual Impact Assessment (Third Edition), Landscape Institute and Institute of Environmental Management and Assessment, 2013;*
- *Technical Guidance Note 06/19: Visual Representation of* Development *Proposals,* published by the Landscape Institute (2019);
- *Technical* Guidance *Note 02/21: Assessing landscape value outside national designations,* published by the Landscape Institute (2021);
- *Technical Guidance Note 02/19: Residential Visual Amenity Assessment,* published by the Landscape Institute (2019);
- *Technical* Guidance *Note 04/20: Infrastructure,* published by the Landscape Institute (2020);
- *An Approach to Landscape Character Assessment,* Natural England, 2014;
- *An Approach to Landscape Sensitivity Assessment,* Natural England, 2019; *and*
- *Advice Note Seventeen: Cumulative Effects Assessment (version 2),* published by PINS (2019).

9.4. Methodology

Data sources to inform baseline characterisation

9.4.1. The following sources of information have been reviewed to inform the baseline assessment presented in **Section 9.5**:

- Ordnance Survey maps at various scales;
- Online Aerial Photography;
- *National Character Area (NCA) Profile 47 - Southern Lincolnshire Edge,* Natural England, 2014;
- *North Kesteven Landscape Character Assessment,* David Tyldesley and Associates, 2007;
- *Central Lincolnshire Local Plan 2012-2036* (adopted, 2023);
- *Scopwick and Kirkby Green Neighbourhood Plan 2021 – 2036* (Made Version, 2023)

- *Green Infrastructure Study for Central Lincolnshire,* CBA, 2011; and
- *Scopwick and Kirkby Green Design Codes,* Final Report, AECOM, 2020

9.4.2. The electronic working copy of the Lincolnshire Definitive Rights of Way map was accessed on 1st September 2023 at the following web address: https://www.lincolnshire.gov.uk/coast-countryside/public-rights-way.

9.4.3. Recreational walks and trails in North Kesteven including the Spires and Steeples Trail, the Ridge and Furrows Trail and a series of circular 'Stepping Out Walks' are promoted locally. The published description of these walks can be viewed at the following web address: [redacted]

Surveys to inform baseline characterisation

9.4.4. Extensive field work has been undertaken by the Applicant's Landscape Architects between July 2022 and September 2023. This has included numerous visits to the Site and surrounding areas in both summer and winter months.

9.4.5. Viewpoint photography, presented in **Volume 4**, was captured on multiple dates between February and June 2023.

9.4.6. All the public rights of way within the Site and the LVIA study area have been walked by the Applicant's Landscape Architects on multiple occasions.

9.4.7. Visits were also made by the Applicant's Landscape Architects to 31 individual residential properties over five days in February and March 2023. The purpose of the visits was to fully understand the visual amenity experienced by some of the nearest residents to the Proposed Development. Further information, including whether properties were viewed internally or just observed from outside, is detailed in **Appendix 9.5: Preliminary Residential Visual Amenity Assessment**.

Design assumptions

9.4.8. **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 Key Plan.

9.4.9. The preliminary design principles and preliminary parameter plans set out the reasonable 'worst case scenario' that has been assessed within this chapter.

9.4.10. This preliminary assessment of the potential likely significant effects has assumed a 'worst case scenario', namely that all development will be at the maximum possible height indicated in **Figure 2.4: Indicative Height Parameters Plan**. Therefore, for example, where the aforementioned plan indicates development of 'solar modules up to 4m in height', the assessment assumes development at 4m in height and where the plan indicates a siting zone for elements up to 12m in height, the assessment assumes that development could be 12m in height anywhere within this zone.

9.4.11. This preliminary assessment also takes account of the various alternative options outlined in **Chapter 3: Reasonable Alternatives Considered**, specifically with reference to potential alternative siting zones for the BESS, Collector Compounds and Springwell Substation, as illustrated in **Figure 2.3: Zonal Masterplan**. When considering receptors that could be affected by development in any of the identified alternative siting zones, a 'worst case scenario' has been assumed, namely that there would be development in that particular siting zone. Therefore, whilst it may be the case that not all of the zones identified for collector compounds are ultimately required for such infrastructure, the assessment assumes this is present in each zone.

9.4.12. At the current time, detailed mitigation proposals have not been developed but will be incorporated into the design of the Proposed Development for the DCO application prior to completion of the ES. In relation to the mitigation of landscape and visual effects this will include, amongst other things, new planting (for example new hedgerows, woodland and scrub planting). This preliminary assessment assumes that there would be relatively extensive new hedgerow and tree planting in Springwell East and Springwell Central but that new planting in Springwell West may be more targeted reflecting the more open character of the landscape. It is likely that there would be a concentration of new mitigation planting around the BESS and Springwell Substation when their final locations are fixed. In this preliminary assessment, new planting is treated as additional (or secondary) mitigation as it has not yet been embedded into the project design. This approach will be reviewed in the ES by which time the mitigation planting will have become embedded into the design of the Proposed Development.

9.4.13. For the purposes of this preliminary assessment (and ultimately the ES), the following assumptions have been made about the growth rate of newly planted hedgerows and trees:

- Newly planted hedgerows and woodland/shrub will be planted as young transplants or 'whips'. In Year 1 after construction the planting stock would typically be approximately 0.6m to 0.8m high and contained within tree protected tubes.
- Hedgerows in Year 10 will be 3.5m in height. This makes an assumption that the plants do not put on much growth in the first planting season and then put on an average of 0.4m growth each subsequent year. This means that all new hedgerows are considered to be at full maturity in Year 10 and are maintained at 3.5m by ongoing management.
- New woodland/scrub planting established as transplants will be 4m in height as it is not maintained at a lower height as is the case for hedgerows.
- Where hedgerow trees are planted as taller specimens or where mature stock is planted elsewhere it is assumed that the trees will be planted as extra heavy standards and in Year 1 these will have a height of 3m to 3.5m. By Year 10, it is assumed that these trees will have a height of approximately 6m.
- Except where vegetation is managed at a specific height (e.g. hedgerows) it is assumed that trees and scrub will continue to grow naturally over the remaining period of the Proposed Development.

Embedded mitigation measures

9.4.14. This preliminary assessment has been based on the principle that certain mitigation measures have been 'embedded' into the design of the Proposed Development to remove or reduce potentially significant effects as far as practicable, for example by the considered placement of infrastructure. 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 landscape and visual amenity assessment comprise the following:

- There will be a minimum 15m offset from built development to existing woodland, whilst noting that it is possible that individual trees may need to be removed to facilitate construction.
- There will be a minimum 10m offset from the Proposed Development to all existing hedgerows.

- There will be a minimum 250m offset from ITS, BESS, Project Substation and Collector Compounds to residential properties.
- Boundary fencing will not be constructed through existing hedgerows or across ditches.
- All internal access tracks and cable routes will use existing tracks, hedgerow crossings and/or gaps in the hedgerows wherever practical.
- Structural planting is to consist of native and indigenous species and wherever possible from local provenance.
- Grid connection cable route will comprise below ground cables.
- All existing PRoW will be retained where practically possible in their existing alignment during the operation of the Proposed Development.
- There will be a minimum 50m offset of ITSs from PRoW.
- The Proposed Development (excluding new landscaping where appropriate) will be set back at least 15m either side from existing or proposed PRoW, except where crossings are necessary.

Assessment methodology

9.4.15. This section provides a summary of the methodology adopted for the preliminary assessment of the potential likely significant landscape and visual effects of the Proposed Development. Full details of the assessment methodology, including assessment criteria, are provided in **Appendix 9.1**.

9.4.16. In accordance with GLVIA3, the significance of landscape and visual effects is determined by considering in tandem the sensitivity of landscape and visual receptors (landscape elements, landscape character areas, landscape designations and groups of people who may be affected by changes in visual amenity) and the magnitude of change arising from the Proposed Development.

9.4.17. The assessment is informed by initial desk studies and site visits to identify receptors.

9.4.18. The desk study included the preparation of several Zone of Theoretical Visibility (ZTV) plans (presented in **Figures 9.5 to 9.8**) to identify potential areas of visibility of the Proposed Development. This information has been used to aid the identification of the study area and receptors likely to be affected. Viewpoints have been identified through consultation to represent a range of distances, directions and receptors located in areas of visibility identified using

the ZTV study and site survey. Viewpoints are used as 'sample' locations to inform the assessment of effects on receptors.

9.4.19. This preliminary assessment provides a full baseline study, including judgements of sensitivity for each receptor, and an initial indication of potential likely significant effects. It should be noted, however, that in the interests of proportionality, a detailed justification for the judgements made regarding magnitude of change and significance of effects is not provided in this preliminary assessment. The LVIA presented in the ES will provide a full justification for all judgements.

9.4.20. For this preliminary assessment, the potential likely effects on all identified receptors are reported, together with an initial consideration of whether the effect is significant or not.

Sensitivity

9.4.21. Sensitivity (described as High, Medium or Low) is judged by combining component judgments about the value and susceptibility of the receptor, as illustrated in **Table 9.4** and **Table 9.5**. An explanation of how susceptibility and value has been determined is provided in **Appendix 9.1**. Detailed susceptibility and value criteria for landscape receptors are established in **Appendix 9.3** whilst detailed visual susceptibility and value criteria are set out in **Appendix 9.1**. It should be noted that intermediate assessments of value or susceptibility may be applied (e.g. High/Medium, Medium/Low or National/Regional, Regional/Community). Likewise, when combining susceptibility and value to determine sensitivity, an intermediate assessment is adopted where overall sensitivity is judged to lie between levels. In all instances, professional judgement is employed and the tables below should not be interpreted rigidly to give a specific answer. A slightly greater weight is given to susceptibility in judging the sensitivity of visual receptors.

Table 9.4 Landscape sensitivity

		Susceptibility		
		High	**Medium**	**Low**
Value	**National**	High	High/medium	Medium
	Regional	High/Medium	Medium	Medium/Low
	Community	Medium	Medium/Low	Low

Table 9.5 Visual sensitivity

		Susceptibility		
		High	**Medium**	**Low**
Value	**National**	High	High/medium	Medium
	Regional	High/Medium	High/Medium	Medium/Low
	Community	High/Medium	Medium	Low

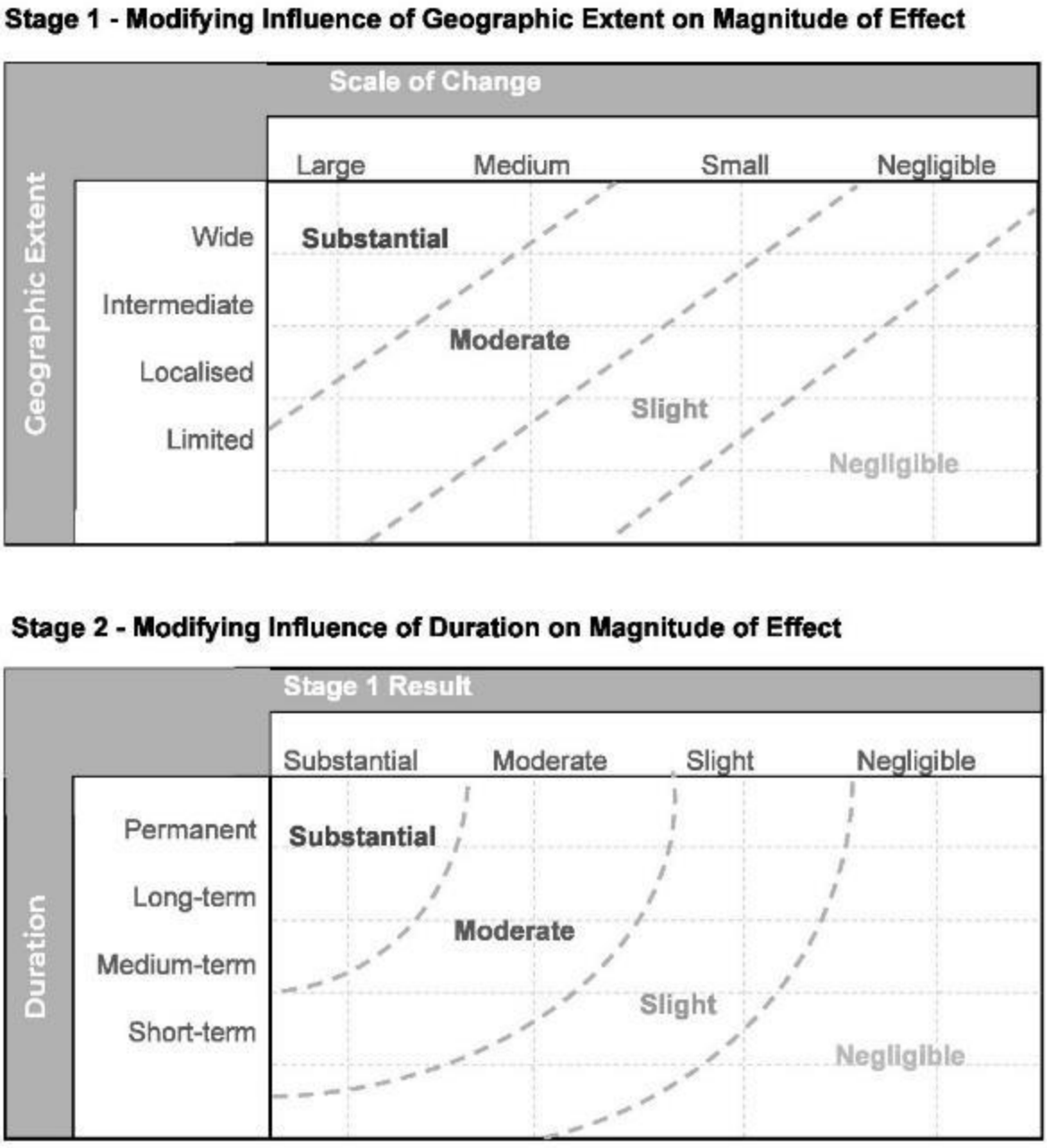
Magnitude of change

9.4.22. The magnitude of change arising from the Proposed Development (described as Substantial, Moderate, Slight or Negligible) is assessed in terms of its scale, geographic extent of the area or receptor that is influenced and its duration.

9.4.23. Scale of change (expressed as Large, Medium, Small, Negligible) is the first and primary factor in determining magnitude. Geographical extent and duration of the effect are modifying factors to the overall magnitude judgement which may be higher if the effect is particularly widespread and/or long lasting, or lower if it is constrained in geographic extent and/or timescale.

9.4.24. The diagrams presented below in **Plate 9.1** illustrate in outline how these two modifying factors are considered in a two-stage process. A judgement is first formed about the scale of the change to the landscape or visual receptor. The geographic extent of the effect is then considered as a modifying influence in the first part of **Plate 9.1** (Stage 1). The result or outcome of Stage 1 is then considered again in relation to the duration of the effect as illustrated in the second part of **Plate 9.1**. The outcome of Stage 2 is the overall magnitude of effect judgement reported in the assessment. **Plate 9.1** is not intended to be interpreted rigidly as a chart to provide definitive answers; professional judgement is employed as appropriate to arrive at an overall judgement on the magnitude of change. A definition of the terms used in the diagrams in **Plate 9.1** is provided in **Appendix 9.1**.

Plate 9.1 Illustration of how magnitude of change is established



9.4.25. Where magnitude of change (or other judgements) is judged to lie between levels, an intermediate assessment is adopted and is expressed as e.g. Moderate/slight.

Significance of effects

9.4.26. The significance of a landscape or visual effect is assessed through professional judgement, combining the sensitivity of the receptor with the predicted magnitude of change, as summarised in **Table 9.6**. **Table 9.6** is not used as a prescriptive tool and illustrates the

typical outcomes, allowing for the exercise of professional judgement.

Table 9.6 Significance of landscape and visual effects

		Magnitude of Change			
		Substantial	**Moderate**	**Slight**	**Negligible**
Receptor Sensitivity	**High**	Major	Major/ Moderate	Moderate	Minor
	Medium	Major/ Moderate	Moderate	Moderate/ Minor	Minor/Negligible
	Low	Moderate	Moderate/ Minor	Minor	Negligible

9.4.27. Where the effect has been classified as Major or Major/Moderate, this is considered to be equivalent to likely significant effects. Where Moderate effects are predicted, professional judgement will be applied to determine whether the effect is significant or not and justification provided for the judgement reached. Effects of Moderate/Minor, Minor, Minor/Negligible or Negligible significance are considered to be not significant.

Beneficial/adverse effects

9.4.28. Landscape and visual effects can be beneficial or adverse and, in some instances, may be considered neutral. Neutral effects are those which overall are neither adverse nor positive but may incorporate a combination of both. Whether an effect is beneficial, neutral or adverse is identified based on professional judgement.

9.4.29. Changes to rural landscapes involving construction of man-made objects of a large scale are generally considered to be adverse and in this preliminary assessment, it has been assumed that where new infrastructure is introduced into the landscape or views, this will generally constitute an adverse effect.

Extent of assessment in this PEIR

9.4.30. The purpose of a LVIA when produced in the context of an EIA is to identify and report any likely significant landscape and visual effects.

9.4.31. In this preliminary assessment, a professional judgement has been made as to whether effects have the potential to be identified as significant based on the parameters outlined and an initial assessment of sensitivity and magnitude of change. Final statements of significance will be reported in the ES once the design

and mitigation has been fixed for the purposes of the DCO application.

Night-time assessment

9.4.32. As noted in **Chapter 2: Description of the Proposed Development**, no areas of the Site will be permanently lit. Whilst it is assumed that the Springwell Substation compound, BESS compounds, and Collector Compounds will include manually operated lighting, in accordance with relevant standards, the lighting design will be directional and only operated in case of emergency or when needed during maintenance works being undertaken during hours of darkness. Due to the infrequent and temporary nature of any night-time lighting, a night-time assessment has not been included in this preliminary assessment. This will be reviewed at ES stage when further details are available and if necessary, a methodology for the night-time assessment will be set out in the ES.

Residential visual amenity assessment

9.4.33. With respect to visual impact, the focus of LVIA is on public views and public visual amenity. Residential Visual Amenity Assessment is a stage beyond LVIA and focuses exclusively on private views and private visual amenity and may be used by the decision maker when weighing potential effects on Residential Amenity in the planning balance.

9.4.34. Technical Guidance Note 2/19 (TGN 2/19) notes that:

"Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view" and

"It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook/visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before."

9.4.35. A detailed Residential Visual Amenity Assessment presented in the ES will identify where the visual effects on residential visual amenity are of such a nature or magnitude that they may need to be considered in the overall balance of 'Residential Amenity' or 'Living Conditions'. The point at which this happens is referred to as the 'Residential Visual Amenity Threshold'.

9.4.36. A summary of the Residential Visual Amenity Assessment work undertaken to date, including a methodology for the full assessment to be included in the ES, is presented in **Appendix 9.5**. However,

the full assessment of effects on residential visual amenity cannot be undertaken until the design for the Proposed Development for DCO application is fixed and mitigation measures developed as necessary.

9.4.37. Views or 'visual amenity' are just one component of the wider consideration of residential amenity and the two should not be confused. The latter is a planning matter and may include aspects such as noise, air quality, traffic, etc., and visual amenity. Residential Visual Amenity Assessment considers the visual amenity aspects of residential amenity only. Where necessary, other aspects of residential amenity will be considered elsewhere in the ES, and it will be for decision makers to weigh all these aspects, and documents/assessments relating to them, in determining the acceptability of the Proposed Development.

9.4.38. Overall residential amenity will be discussed within the Planning Statement accompanying the DCO application for the Proposed Development.

Distances

9.4.39. Where distances are given in this chapter, these are approximate distances between the nearest above ground feature of the Proposed Development based on the parameter plans (not the Site boundary) and the nearest part of the receptor in question unless explicitly stated otherwise.

Visual aids

9.4.40. Zone of Theoretical Visibility (ZTV) maps have been generated using GIS to assist in identifying areas where visibility of the Proposed Development would not occur as well as in viewpoint selection, to illustrate areas from where part or all of the Proposed Development may be visible and to indicate its potential influence in the wider landscape.

9.4.41. Two types of ZTV have been presented in the LVIA:

- Standard Screening ZTVs – which take account of buildings and significant blocks of woodland in the landscape; and
- Detailed Screening ZTVs which also take account of hedgerows and other vegetation over 2.5m in height.

9.4.42. The following ZTVs have been prepared to help illustrate the potential visibility of the Proposed Development:

- **Figures 9.5a-d –** Standard Screening ZTVs for the Solar PV modules;
- **Figures 9.6a-d –** Detailed Screening ZTVs for the Solar PV modules;

- **Figures 9.7a-d –** Detailed Screening ZTVs for the Potential Siting Zones for Structures up to 6m; and
- **Figure 9.8** - Detailed Screening ZTV for the Potential Siting Zones for Structures up to 12m.

9.4.43. Annotated photographs of the existing views at all viewpoints are provided in **Volume 4** of this PEIR. The method of visualisation selected has been informed by Landscape Institute Technical Note 06/19[112], with annotated photographs being the most appropriate approach at this PEIR stage before the design is finalised.

9.4.44. The methodology for production of the ZTVs and the visualisations is described in **Appendix 9.1**. Photowires and/or photomontage visualisations will be provided in the ES for key viewpoint locations yet to be agreed with consultees.

9.5. Summary of baseline conditions

9.5.1. **Figure 9.1** illustrates the landscape context for the Proposed Development, including the location of local landscape designations. The three land parcels (Springwell East, Central and West) fall across a broad and undulating plateau and dip slope which falls gradually eastwards from the A607 between Grantham and Lincoln towards the Lincolnshire Fens. Landform across the plateau is relatively gentle. Part of the plateau has a history of use for airfields and RAF airbases (notably RAF Digby). Modern large scale arable farming now sits alongside an older, sparse settlement pattern of small scale hamlets and isolated farmsteads.

9.5.2. Vegetation structure and the degree of enclosure created by hedgerows, woodland blocks and tree groups across the Site is variable. The landscape is notably more open in the west near the A15 and more enclosed in the east around Scopwick, Blankney and Kirkby Green.

Landscape designations

9.5.3. No part of the Site or its immediately surrounding context falls within a statutorily designated landscape. The nearest AONB or National Park to the Site is the Lincolnshire Wolds AONB, located more than 20km to the northeast and would not be affected by any development within the Site. As noted in **Table 9.2** above, the AONB has been scoped out of further assessment.

9.5.4. There are no Registered Parks and Gardens within 5km of any part of the Site; the nearest is located just over 6.5km to the northwest. Again, there would be no visibility of the Proposed Development at this distance.

[112] Technical Guidance Note 06/19: Visual Representation of Development Proposals, published by the Landscape Institute (2019);

9.5.5. There are also no local landscape designations covering any part of the Site. The nearest local designation is the Lincoln Cliff AGLV; an escarpment west of and parallel to the A607 between Grantham and Lincoln. This AGLV is illustrated on **Figure 9.1** and is located approximately 3km to the west of Springwell West. There would be no view of the Proposed Development from the Lincoln Cliff AGLV and as noted in **Table 9.2** above, the Lincoln Cliff AGLV has been scoped out of further assessment.

Landscape character

9.5.6. Several published studies have informed this preliminary assessment. The primary descriptions of baseline landscape character are contained within:

- *National Character Area Profile[113] 47 (NCA 47) – Southern Lincolnshire Edge; and*
- *North Kesteven Landscape Character Assessment (NKLCA).*

9.5.7. At a national level, the Site falls within NCA 47 – Southern Lincolnshire Edge and the majority of the study area also falls within this NCA.

9.5.8. At a district level, the North Kesteven Landscape Character Assessment identifies four regional Landscape Character Types (LCTs)[114]. The Site and the entire study area falls within the Central Plateau LCT.

9.5.9. The LCTs are further subdivided into Landscape Character Sub-Areas (LCAs)[115]. Springwell West and Springwell Central fall within LCA 7 - The Limestone Heath LCA whilst Springwell East falls within LCA 11 - The Central Clays and Gravels LCA.

9.5.10. LCA 6 – Lincoln Cliff and LCA 13 – Fens lie approximately 3km to the west and 3km to the east respectively of the Site. The ZTVs presented in **Figures 9.5 to 9.8** demonstrate that there would be negligible visibility of the Site from either of these two adjoining LCAs.

9.5.11. Site survey work has concluded that there would be no view of the Proposed Development beyond the two host LCAs and as noted in **Table 9.2** above, LCA 6 and LCA 13 have been scoped out of further assessment.

[113] A National Character Area (NCA) is a natural subdivision of England based on a combination of landscape, biodiversity, geodiversity and economic activity. There are 159 National Character Areas and they follow natural, rather than administrative, boundaries.
[114] Landscape Character Types are defined as distinct types of landscape that are relatively homogeneous in character (An Approach to Landscape Character Assessment, Natural England, 2014).
[115] Landscape Character Areas are the unique individual geographical areas in which landscape types occur (An Approach to Landscape Character Assessment, Natural England, 2014).

9.5.12. Relevant extracts from the above two documents and an analysis of relevant LCAs is provided in **Appendix 9.2**.

9.5.13. The boundaries of the North Kesteven LCAs are illustrated on **Figure 9.2**.

9.5.14. Site survey work has identified that there are notable differences in the landscape character across the three identified parcels of land and these reflect the boundaries of the LCAs relatively accurately. Notably, the landscape within Springwell West and Springwell Central is more open with limited mature vegetation structure whereas the landscape within Springwell East is more enclosed with more dense and established vegetation.

Visual receptors

9.5.15. The primary visual receptors identified within the study area and likely to be affected by the Proposed Development include:

- Residents (within settlements and at isolated farmsteads/dwellings);
- Users of public rights of way (PRoW); and
- Users of the local and trunk road network.

9.5.16. Potential visual receptors of the Proposed Development are identified on **Figures 9.3a-d**.

9.5.17. The villages/hamlets of Scopwick, Kirkby Green and Blankney lie just beyond the boundaries of Springwell East. Scopwick Cemetery and the play area in Scopwick are noted as sensitive recreational receptor locations. Likewise, the Blankney Walks car park and picnic area and the Kirkby Green Stepping Out car park are identified as sensitive recreational receptor locations.

9.5.18. Likewise, the village of Ashby de la Launde lies south of Springwell Central and east of Springwell West.

9.5.19. The residential quarters within the barracks at RAF Digby lie just beyond the boundaries of Springwell Central and Springwell West and the sports fields and play area are identified as sensitive recreational receptor locations.

9.5.20. Elsewhere, there are isolated residential properties and farmsteads, which are discussed in **Appendix 9.5: Preliminary Residential Visual Amenity Assessment** and illustrated on **Figure 9.9**.

9.5.21. The ZTVs demonstrate that there would be no view from the settlements of Dunston, Metheringham, Martin, Timberland, Rowston, Digby, Bloxholm, Cranwell, Wellingore and Navenby; all of which lie within the LVIA study area. These settlements have been scoped out of further assessment and are not discussed further – see **Table 9.2**. Metheringham Airfield Visitor Centre is also noted as a local tourism and recreational receptor.

9.5.22. A review of the Lincolnshire County Council Definitive PRoW Map has shown several PRoWS in the surrounding area and across the parcels, including locally promoted routes. These are identified in **Figures 9.3a-d**.

9.5.23. The Spires and Steeples Trail (a regionally promoted recreational walk) runs north to south through Springwell East connecting Blankney and Scopwick.

9.5.24. The Ridge and Furrow Trail (another regionally promoted recreational walk) passes approximately 1km to the west of the Site.

9.5.25. The Viking Way (another regionally promoted recreational walk) passes approximately 2km to the west of the Site.

9.5.26. A series of locally promoted 'Stepping Out' walks pass through Springwell East and pass close to the boundaries of the Site within Springwell Central and Springwell West.

9.5.27. Bloxholm Woods car park and nature reserve walks are identified as a sensitive recreational receptor location.

9.5.28. Whilst there is a relatively high concentration of PRoWs in Springwell East, there is a relative sparsity within Springwell West and Springwell Central.

9.5.29. The only recreational land use focussed on the landscape within the study area, other than the PRoWs noted above, is Blankney Golf Course.

9.5.30. Springwell West and Springwell Central are also openly visible from the A15 trunk road and the B1191 (Heath Road) which runs between the A15 and Scopwick. Other minor roads and country lanes pass through Springwell West but again these are sparse.

9.5.31. There are no tourist attractions or recognised viewpoints within the study area from which the Proposed Development may be visible.

Sensitivity of receptors

Landscape sensitivity appraisal

9.5.32. In order to inform the preliminary assessment of potentially significant effects on landscape character, a landscape sensitivity appraisal has been undertaken considering the various landscape susceptibility and value criteria, which combine to determine landscape sensitivity to the type of development proposed. The appraisal draws upon observations contained within National Character Area Profile 47 and the North Kesteven Landscape Character Assessment (as summarised in **Appendix 9.2**); as well as observations made in the field during the baseline assessment of landscape character. It should be noted that both LCAs extend considerably beyond the study area. The conclusions regarding

landscape sensitivity, therefore, relate specifically to the tract of the LCAs within the study area.

9.5.33. The landscape sensitivity appraisal is presented in **Appendix 9.3**. The principal findings of the appraisal are summarised below in **Table 9.7**.

Table 9.7 Summary of landscape sensitivity

Character Area	Susceptibility	Value	Sensitivity
LCA 7 - The Limestone Heath	Medium	Community	Medium/Low
LCA 11 - The Central Clays and Gravels	Medium/Low	Regional/Community	Medium/Low

Sensitivity of visual receptors

9.5.34. Based on analysis to date, the visual receptors groups identified in **Table 9.8** are taken forward and will form the focus of further assessment in the LVIA. The sensitivity of these receptors groups varies and is also indicated in **Table 9.8**.

9.5.35. PRoWs are grouped together based on the likely nature of the effects. Isolated residential properties and farmsteads are addressed as part of the receptor group in which they are most closely located. Further information on the closest residential properties can be found in **Appendix 9.5**.

9.5.36. All key visual receptor locations are shown on **Figures 9.3a-d**.

Table 9.8 Summary of visual receptor sensitivity

Visual Receptors	Susceptibility	Value	Sensitivity
Scopwick (settlement)	High	Community	High/Medium
Kirby Green (settlement)	High	Community	High/Medium
Blankney (settlement)	High	Community	High/Medium
Barracks at RAF Digby (settlement)	High	Community	High/Medium
Ashby de la Launde (settlement)	High	Community	High/Medium
PRoWs between Blankney, Scopwick	High	Community/Regional	High/Medium

Visual Receptors	Susceptibility	Value	Sensitivity
and Kirkby Green extending up to Blankney Walks Lane and the railway on the eastern site boundary (including several 'Stepping Out' walks)			
PRoWs between the railway on the eastern boundary and the B1189	High	Community	High/Medium
PRoW between RAF Digby and B1188 (Footpath R5/1)	High	Community	High/Medium
PRoWs and lanes between Heath Road, Bloxholm Lane and Green Man Lane extending up to the A15 north of RAF Digby	High	Community	High/Medium
Navenby Lane	Medium	Community	Medium
PRoWs between Bloxholm, Ashby de la Launde and Heath Road	High	Community	High/Medium
Bloxholm Woods Local Nature Reserve Footpath	High	Regional	High/Medium
Church Lane, church and properties at Brauncewell	High	Community	High/Medium
PRoWs and lanes south west between A15 and Brauncewell	High	Community	High/Medium
Minor Roads to Temple Bruer and	Medium	Community	Medium

Visual Receptors	Susceptibility	Value	Sensitivity
Thompsons Bottom Farm			
PRoWs and lanes north west between A15 and Wellingore Heath including New England Lane and Gorse Hill Lane	High	Community	High/Medium
Spires and Steeples Trail (linear route)	High	Regional	High/Medium
Ridge and Furrow Trail (linear route)	High	Regional	High/Medium
Viking Way and High Dike (linear route)	High	Regional	High/Medium
A15 trunk road (linear route)	Low	Community	Low
B1191 (Heath Road) (linear route)	Medium	Community	Medium
B1188 (linear route)	Medium	Community	Medium
B1189 (linear route)	Medium	Community	Medium

Future baseline

9.5.37. For the purposes of this preliminary assessment, the future baseline has been taken to be the same as the current baseline. Over the lifetime of the Proposed Development, agricultural practices and crops may change resulting in alterations to the baseline arable landscape. Climate change may expediate this change in the landscape; however, such change is difficult to predict with any certainty and it is therefore assumed that the baseline will remain unaltered.

9.6. Likely effects, additional mitigation and residual effects

General approach to existing landscape fabric

9.6.1. The project principles (outlined in **Chapter 4: Approach to EIA**) underlying the evolution of the Proposed Development include the commitment to retain existing vegetation wherever reasonably possible to retain the fabric of the Site and aid assimilation of

development into its context. All internal access tracks and cable routes will use existing tracks, hedgerow crossings and/or gaps in the hedgerows wherever practicable.

9.6.2. Whilst some minor vegetation removal may be unavoidable, it is anticipated that this would be minimal and that there would be an overall net gain in quantity and quality of landscape fabric once mitigation planting becomes established.

Preliminary viewpoint analysis

9.6.3. Thirty eight (38) viewpoints have been agreed, in consultation with North Kesteven District Council and Lincolnshire County Council, to represent the main landscape and visual receptors found in the study area.

9.6.4. The final LVIA presented in the ES will include a detailed viewpoint assessment carried out from the agreed viewpoints. In order to inform the assessment of potentially significant landscape and visual effects arising as a result of the Proposed Development in this PEIR, a preliminary viewpoint analysis is presented in **Appendix 9.4**.

9.6.5. The location of the viewpoints is shown on **Figure 9.4** (Viewpoint Location Plan) and also on the ZTVs presented in **Figures 9.5 to 9.8**.

9.6.6. Annotated panoramic photographs are provided to illustrate the potential extent of development visible at each viewpoint location in **Volume 4** (Viewpoints 1-38).

9.6.7. The preliminary viewpoint analysis presented in **Appendix 9.4** identifies which part or parts of the Proposed Development are likely to be visible from each viewpoint, based on interpretation of the parameters plans in this PEIR. Commentary is also provided where appropriate to indicate what measures may be proposed to mitigate the scale of the change in the view.

Approach to mitigation and residual effects in the LVIA

9.6.8. At the current time, detailed mitigation proposals are in the process of being developed. However, for the purposes of this PEIR, it is assumed that mitigation will be incorporated into the design of the Proposed Development before completion of the ES and, in relation to landscape and visual effects, this is most likely to include new planting (including new hedgerows, woodland and scrub planting). In this preliminary assessment, new planting is treated as additional (or secondary) mitigation. This approach will be reviewed in the ES by which time the mitigation planting will have become embedded in the design.

9.6.9. High quality design will be secured, in part, through the ongoing and careful site selection for the various components of the Proposed Development taking account of the potential landscape and visual

effects of the Proposed Development. Removal or disruption to any existing landscape fabric (i.e trees, hedgerows) will be minimised to that which is absolutely necessary for the construction of the Proposed Development.

9.6.10. A comprehensive landscape scheme will be developed in accordance with the principles of good design to integrate the Proposed Development into the landscape and to mitigate visual effects as far as practicable. The landscape strategy will be complementary to any biodiversity and other environmental objectives. The landscape design will seek to deliver landscape enhancements over and above the requirement to simply mitigate adverse effects.

9.6.11. The landscape mitigation proposals will be developed as part of the Proposed Development and be embedded into the DCO application. These can be secured through DCO Requirements.

9.6.12. In the LVIA presented in the ES, there will not be a separate assessment of effects before and after mitigation as this will be embedded into the design. Within this PEIR and in the ES, an assessment will be made, firstly, at a period in time when the new planting is implemented (Year 1 following construction) and, secondly, at a period in time when it is assumed that any new planting has become established (Year 10 following construction).

Construction and Decommissioning phases

9.6.13. In terms of landscape and visual effects, it has been assumed that construction and decommissioning effects would be broadly similar and therefore the assessment below covers both phases.

9.6.14. The most significant effects on landscape character and visual amenity as a whole are likely to arise from the incremental increase in the in-situ infrastructure comprising the Proposed Development as reported in the subsequent section of the chapter and the presence of this infrastructure is likely to be more significant than the activities associated with the act of construction itself.

9.6.15. Likewise, during decommissioning, there would be an incremental decrease in the in-situ infrastructure comprising the Proposed Development, and this is likely to be more significant than the activities associated with the act of decommissioning itself.

9.6.16. In this preliminary assessment, once construction activity in the vicinity of a receptor has been completed and activity has moved on to somewhere else in the Site, the effects are treated as operational effects (i.e. the infrastructure in-situ in that particular location of the Site). Construction/decommissioning effects are treated as the additional effects associated with the act of constructing/decommissioning the Proposed Development and do

not include the effects of the Proposed Development itself as it is incrementally built out/removed.

9.6.17. For the avoidance of doubt, with reference to the LVIA methodology, the construction and decommissioning phases are considered likely to give rise to medium term effects although it should be noted that in many locations construction/ decommissioning activity would be completed much quicker than the overall construction/decommissioning period and here effects would be short term.

9.6.18. Effects during construction/decommissioning on landscape character would typically arise from:

- short-term change of farmland to a construction/decommissioning site including the formation of temporary works compounds;
- increased vehicular movement and personnel in the landscape erecting/removing the component parts of the Proposed Development; and
- changes to landscape fabric resulting from any vegetation removal or new planting (during construction only).

9.6.19. Effects during construction/decommissioning on visual receptors would typically arise from:

- short-term movement of vehicles and plant within and travelling to and from the Proposed Development to deliver and install or remove the solar farm components, and other site infrastructure; and
- increasing/decreasing coverage of the panel areas with Solar PV modules and other components of the Proposed Development, with similar effects to the operational stage.

9.6.20. **Table 9.9** summarises the likely landscape and visual effects during construction/decommissioning on the receptors previously identified in **Table 9.8**.

9.6.21. For the purposes of this preliminary assessment, it has been assumed that where construction/decommissioning activity is introduced into the landscape or views, this will constitute an adverse effect.

9.6.22. It is unlikely that any additional (secondary) mitigation would be effective during the construction/decommissioning phases and therefore none have been identified in **Table 9.9**. However, once more detail is available about the likely construction/decommissioning activities, this will be reviewed to identify if any additional mitigation is appropriate.

Table 9.9 Assessment of likely effects, additional mitigation and residual effects during construction and decommissioning

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
LCA 7 Limestone Heath	Likely effects	It is likely that during construction/decommissioning there would be a large or medium scale of change to landscape character up to 1km from the Proposed Development in this LCA (potentially extending up to 2km from the Springwell Substation in the north). Beyond these distances however, there is unlikely to be any greater than a small or negligible scale of change in character.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of this LCA is considered to be **medium/low**. The likely scale of change would vary across the LCA from high to negligible with distance from the Site; high to medium scale of change occurring in the following locations: • from Green Man Lane in the north to just south of Dunston Pit Plantation and extending west of the A15 as far as Wellingore Heath, Temple Bruer and Brauncewell; • to the east of the A15, potentially extending up to Heath Road as far as RAF Digby; • on the eastern side of Heath Road extending up to a series of plantations to the east (Bloxham Woods, Ashby Thorns, Rowston Covert); and • across the tract of land between RAF Digby, Scopwick, the B1188 and Rowston Covert. Across this area as a whole there would be a **substantial or moderate** magnitude of change and an effect of **major or major/moderate** significance. Collectively this would constitute a **significant** effect on the LCA.
LCA 11 Central Clays and Gravels	Likely effects	It is likely that during construction/decommissioning there would be a large or medium scale of change to landscape character within a tightly defined tract of this LCA contained by the B1188 to the west, Blankney

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
		Walks Lane to the north, Trundle Lane to the south and the railway embankment along the eastern boundary of the Site. Beyond these boundaries, there is unlikely to be any greater than a small or negligible scale of change in character.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of this LCA is considered to be **medium/low**. The likely scale of change would vary across the LCA from high to negligible with distance from the Site; high to medium scale of change occurring in the following locations: • a tract of the LCA contained by the B1188 to the west, Blankney Walks Lane to the north, Trundle Lane to the south and the railway embankment along the eastern boundary of the Site. Across this area there would be a **substantial or moderate** magnitude of change and an effect of **major/moderate** significance. Collectively this would constitute a **significant** effect on part of the LCA as defined above.
Scopwick, Kirkby Green and Blankney (including recreational receptor locations therein)	Likely effects	It is unlikely that there would be any view of the proposed construction/decommissioning activities from within the villages of Scopwick, Blankney or Kirkby Green due to intervening vegetation.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **negligible** (tending towards no effect at all) and the likely significance of effect is **negligible**. This would be **not significant**.
RAF Digby (including recreational	Likely effects	It is likely that there would be views of construction/decommissioning at relatively close proximity from some properties.

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
receptor locations therein)	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **moderate** and the likely significance of effect is **moderate**. This would potentially give rise to a **significant** effect.
Ashby de la Launde	Likely effects	It is likely that there would be distant glimpses only of construction/decommissioning from the edge of Ashby de la Launde.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **negligible** (tending towards no effect at all) and the likely significance of effect is **negligible**. This would be **not significant**.
Individual/ Isolated Residential Properties	Likely effects	It is likely that there would be views of construction/decommissioning at relatively close proximity from a small number of individual isolated properties. However, at this time insufficient detail is available about the construction/decommissioning activities to comment on individual cases.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **substantial** magnitude of change at a small number of individual isolated properties and in this worst case scenario the likely significance of effect would be **major**. This would potentially give rise to a **significant** effect.

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
PRoWs between Blankney, Scopwick and Kirkby Green extending up to Blankney Walks Lane and the railway on the eastern site boundary	Likely effects	It is likely that during construction/decommissioning there would be a large or medium scale of change to views from many of the PRoWs in this group although activity is only likely to be experienced along any individual footpath for a short term period.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. This would potentially give rise to a **significant** effect.
PRoWs between the railway on the eastern boundary and the B1189	Likely effects	It is likely that during construction/decommissioning there would be no greater than a small scale of change in views from this network of footpaths.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **slight/negligible** and the likely significance of effect is **minor**. This would be **not significant**.
PRoW between RAF Digby and B1188 (Footpath R5/1)	Likely effects	It is likely that during construction/decommissioning there would be a large or medium scale of change to views from various lengths of this footpath, although activity is only likely to be experienced along for a short term period.
	Additional (secondary) mitigation	None identified

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. This would potentially give rise to a **significant** effect.
PRoWs and lanes between Heath Road, Bloxholm Lane and Green Man Lane extending up to the A15 north of RAF Digby	Likely effects	It is unlikely that there would be any greater than a small scale of change in view on these PRoWs.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **slight** and the likely significance of effect is **moderate/minor**. This would be **not significant**.
Navenby Lane	Likely effects	It is likely that during construction there would be a large or medium scale of change to views from various lengths of this road
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. This would potentially give rise to a **significant** effect.
PRoWs between Bloxholm, Ashby de la Launde and Heath Road	Likely effects	It is unlikely that there would be any greater than a small scale of change in view from these PRoWs.
	Additional (secondary) mitigation	None identified

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **slight** and the likely significance of effect is **moderate/minor**. This would be **not significant**.
Bloxholm Woods Local Nature Reserve Footpath	Likely effects	It is likely that during construction there would be a large or medium scale of change to views from various lengths of this footpath.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. This would potentially give rise to a **significant** effect.
Church Lane, church and properties at Brauncewell	Likely effects	It is unlikely that there would be any greater than a small scale of change in view on this group of receptors.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **slight** and the likely significance of effect is **moderate/minor**. This would be **not significant**.
PRoWs and lanes south west between A15 and Brauncewell	Likely effects	It is likely that during construction there would be a large or medium scale of change to views from various lengths of these footpaths.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
		stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. This would potentially give rise to a **significant** effect.
Minor Roads to Temple Bruer and Thompsons Bottom Farm	Likely effects	It is likely that during construction there would be a large or medium scale of change to views from various lengths of these roads.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. This would potentially give rise to a **significant** effect.
PRoWs and lanes north west between A15 and Wellingore Heath including New England Lane and Gorse Hill Lane	Likely effects	It is likely that during construction there would be a large or medium scale of change to views from various lengths of these footpaths.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **major/moderate**. This would potentially give rise to a **significant** effect.
Spires and Steeples Trail (linear route)	Likely effects	It is likely that during construction there would be a large or medium scale of change to views from the section of this trail between Blankney and Scopwick only.

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. This would potentially give rise to a **significant** effect.
Ridge and Furrow Trail (linear route)	Likely effects	It is unlikely that there would be any greater than a small scale of change in view from this trail.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **slight** and the likely significance of effect is **moderate/minor**. This would be **not significant**.
Viking Way and High Dike (linear route)	Likely effects	It is unlikely that there would be any greater than a small scale of change in view from this trail.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change is likely to be **slight** and the likely significance of effect is **moderate/minor**. This would be **not significant**.
A15 trunk road (linear route)	Likely effects	It is likely that during construction there would be a large scale of change to views from the A15 between approximately Green Man Lane in the north and Dunston House in the south.
	Additional (secondary) mitigation	None identified

Receptor/Matter		Likely effects/additional (secondary) mitigation/residual effects	
		Likely residual effects	The sensitivity of these receptors is **low**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate/minor**. This would be **not significant**.
B1191 Road) route)	(Heath (linear	Likely effects	It is possible that during construction there would be a large or medium scale of change to views in places from the Heath Road between the A15 and RAF Digby.
		Additional (secondary) mitigation	None identified
		Likely residual effects	The sensitivity of these receptors is **medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. Noting that moderate effects may or may not be significant, it is the professional opinion of the assessors that in this instance, the effect would be **not significant**.
B1188 route)	(linear	Likely effects	It is possible that during construction there would be a large or medium scale of change to views in places between Scopwick and Blankney.
		Additional (secondary) mitigation	None identified
		Likely residual effects	The sensitivity of these receptors is **medium**. Adopting a worst case scenario and in the absence of construction/decommissioning detail, at this stage it is assumed that there may be up to a **moderate** magnitude of change and in this worst case scenario the likely significance of effect would be **moderate**. Noting that moderate effects may or may not be significant, it is the professional opinion of the assessors that in this instance, the effect would be **not significant**.

Receptor/Matter	Likely effects/additional (secondary) mitigation/residual effects	
B1189 (linear route)	Likely effects	It is unlikely that there would be any greater than a negligible scale of change in view from this road.
	Additional (secondary) mitigation	None identified
	Likely residual effects	The sensitivity of these receptors is **medium**. There would be a **negligible** magnitude of change (tending towards no effect at all) and the significance of effect would be **negligible**. This would be **not significant**.

Operational phase

9.6.23. Operational effects are assessed at two distinct periods in time; at the completion of construction (year 1) and also at a point in time when it is assumed that most of the new mitigation planting including hedgerows will have become established (year 10). For the avoidance of doubt, with reference to the LVIA methodology, the year 1 effects are considered to be medium term effects whilst the year 10 effects are considered to be long term.

9.6.24. Effects during operation on landscape character would typically arise from:

- the long-term change of farmland to a solar farm with associated BESS and grid infrastructure; and
- changes to vegetation cover and accessibility.

9.6.25. Effects during operation on visual receptors would arise from changes to views towards the panel areas to include the fencing, tracks, solar modules and other infrastructure elements within fenced areas, both from static locations and when moving along routes (both existing and proposed) through the landscape.

9.6.26. Changes to rural landscapes involving construction of man-made objects of a large scale are generally considered to be adverse and in this preliminary assessment, it has been assumed that where new infrastructure is introduced into the landscape or views, this will generally constitute an adverse effect.

Table 9.10 Assessment of likely effects, additional mitigation and residual effects during operation

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
LCA 7 Limestone Heath	Likely effects	It is likely that during operation there would be a large or medium scale of change to landscape character up 1km from the Proposed Development in this LCA (potentially extending up to 2km from the Springwell Substation in the north). Beyond these distances however, there is unlikely to be any greater than a small or negligible scale of change in character.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of this LCA is considered to be **medium/low**. Year 1 – The likely scale of change would vary across the LCA from high to negligible with distance from the Site; high to medium scale of change occurring in the following locations: • from Green Man Lane in the north to just south of Dunston Pit Plantation and extending west of the A15 as far as Wellingore Heath, Temple Bruer and Brauncewell; • to the east of the A15, potentially extending up to Heath Road as far as RAF Digby; • on the eastern side of Heath Road extending up to a series of plantations to the east (Bloxham Woods, Ashby Thorns, Rowston Covert); and • across the tract of land between RAF Digby, Scopwick, the B1188 and Rowston Covert. Across this area as a whole there would be a **substantial or moderate** magnitude of change and an effect of **major/moderate** significance. Collectively this would constitute a **significant** effect on part of the LCA as defined above. Year 10 - Although the scale of change and overall significance of effect is likely to be reduced by mitigation, it is likely that effects on landscape character will remain in the long term

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
		across much of the same tract of the LCA identified above. Across this area as a whole, there would remain a **substantial or moderate** magnitude of change and an effect of **major/moderate** significance. Collectively this would constitute a **significant** effect on part of the LCA as defined above.
LCA 11 Central Clays and Gravels	Likely effects	It is likely that during operation there would be a large or medium scale of change to landscape character within a tightly defined tract of this LCA contained by the B1188 to the west, Blankney Walks Lane to the north, Trundle Lane to the south and the railway embankment along the eastern boundary of the Site. Beyond these boundaries, there is unlikely to be any greater than a small or negligible scale of change in character.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of this LCA is considered to be **medium/low**. Year 1 – The likely scale of change would vary across the LCA from high to negligible with distance from the Site; high to medium scale of change occurring in the following locations: • a tract of the LCA contained by the B1188 to the west, Blankney Walks Lane to the north, Trundle Lane to the south and the railway embankment along the eastern boundary of the Site. Across this area there would be a **substantial or moderate** magnitude of change and an effect of **major/moderate** significance. Collectively this would constitute a significant effect on part of the LCA as defined above. Year 10 - The magnitude of change, and therefore the significance of effect, is likely to be reduced by mitigation. Across this area there would remain **moderate** magnitude of change and an effect of **moderate** significance. Noting that moderate effects may or may not be

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
		significant, it is the professional opinion of the assessors that in this instance, the effect would be **not significant**.
Scopwick, Kirkby Green and Blankney (including recreational receptor locations therein)	Likely effects	It is unlikely that there would be any view of the Proposed Development from within the villages of Scopwick, Blankney or Kirkby Green due to intervening vegetation.
	Additional (secondary) mitigation	None required
	Likely residual effects	The sensitivity of these receptors is **high/medium**. The magnitude of change would be **negligible** (tending towards no effect at all), and the significance of effect would also be **negligible**. This would be **not significant**.
RAF Digby (including recreational receptor locations therein)	Likely effects	It is likely that there would be views of the Proposed Development at relatively close proximity to some properties.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - The magnitude of change is likely to be **moderate** and the likely significance is **major/moderate**. This would potentially give rise to a **significant** effect. Year 10 - The magnitude of change in view in view is likely to be **slight** and the significance of effect would be **moderate/minor**. This would be **not significant**.
Ashby de la Launde	Likely effects	It is likely that there would be distant glimpses of the Proposed Development from the edge of Ashby de la Launde.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - The likely magnitude of change in view would be **slight/negligible** and the significance of effect would be **moderate/minor**. This would be **not significant**. Year 10 - The likely magnitude of change in view would be **negligible** (tending towards no effect at all) and the significance of effect would be **negligible**. This would be **not significant**.
Individual/ Isolated Residential Properties	Likely effects	It is likely that there would be a large or medium scale of change in the views experienced by a relatively small number of isolated residential properties identified in **Appendix 9.5**.
	Additional (secondary) mitigation	The Applicant will seek to develop bespoke landscape mitigation measures where necessary.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. It is possible that there would be a **substantial** or **moderate** magnitude of change at some properties depending on the final design for the ES and the mitigation measures adopted and in the worst case scenario the likely significance of effect would be **major**. This may give rise to **significant** visual effects at some individual or clusters of isolated properties throughout the study area. These are addressed in the preliminary Residential Visual Amenity Assessment presented in **Appendix 9.5**.
PRoWs between Blankney, Scopwick and Kirkby Green extending up to Blankney Walks Lane and the railway on the eastern site boundary	Likely effects	It is likely that during operation there would be a large or medium scale of change to views from many of the PRoWs in this group.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**.

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
		Year 1 – The likely magnitude of change in the views from these PRoWs when considered together would be **substantial/moderate** and the significance of effect would be **major/moderate**. This would potentially give rise to a **significant** effect. Year 10 - The likely magnitude of change in the views from these PRoWs when considered together would be **moderate** and the significance of effect would be **moderate**. This would potentially remain a **significant** effect.
PRoWs between the railway on the eastern boundary and the B1189	Likely effects	It is likely that during operation there would be no greater than a small scale of change in views from this network of footpaths.
	Additional (secondary) mitigation	None required
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - The magnitude of change would be **slight/negligible**, and the significance of effect would be **minor**. This would be **not significant**. Year 10 – There would be no change to magnitude or significance in Year 10.
PRoW between RAF Digby and B1188 (Footpath R5/1)	Likely effects	It is likely that during operation there would be a large or medium scale of change to views from part of this footpath.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 – The likely magnitude of change in the views from this PRoW would be **substantial/moderate** and the significance of effect would be **major/moderate**. This would potentially give rise to a **significant** effect. Year 10 - The likely magnitude of change in the views from this PRoW would be **slight** and the

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
		significance of effect would be **moderate**. Noting that moderate effects may or may not be significant, it is the professional opinion of the assessors that in this instance, the effect would be **not significant**.
PRoWs and lanes between Heath Road, Bloxholm Lane and Green Man Lane extending up to the A15 north of RAF Digby	Likely effects	It is unlikely that there would be any greater than a small or medium scale of change in view on these PRoWs.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 – The likely magnitude of change in the views from these PRoWs would be **moderate/slight** and the significance of effect would be **moderate**. Noting that moderate effects may or may not be significant, it is the professional opinion of the assessors that in this instance, the effect would be **not significant**. Year 10 - The likely magnitude of change in the views from these PRoWs would remain **moderate/slight** and the significance of effect would be **moderate**. This would be **not significant**.
Navenby Lane	Likely effects	It is likely that during operation there would be a large or medium scale of change to views from various lengths of this road.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **medium**. Year 1 - The likely magnitude of change in view would be **moderate** and the significance of effect would be **moderate**. This would potentially give rise to a **significant** effect. Year 10 - The likely magnitude of change in view would be **moderate/slight** and the significance of effect would be

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
		moderate/minor. This would be **not significant**.
PRoWs between Bloxholm, Ashby de la Launde and Heath Road	Likely effects	It is unlikely that there would be any greater than a small scale of change in view overall from these PRoWs.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - The likely magnitude of change would be **slight/negligible**, and the significance of effect would be **minor**. This would be **not significant**. Year 10 – There would be no change to magnitude or significance in Year 10.
Bloxholm Woods Local Nature Reserve Footpath	Likely effects	It is likely that during operation there would be a large or medium scale of change to views from various lengths of this footpath (mostly in winter).
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - The likely magnitude of change in view would be **substantial/moderate** and the significance of effect would be **major/moderate**. This would potentially give rise to a **significant** effect. Year 10 - The likely magnitude of change in view would be **slight** and the significance of effect would be **moderate/minor**. This would be **not significant**.
Church Lane, church and	Likely effects	It is unlikely that there would be any greater than a small scale of change in view on this group of receptors.

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
properties at Brauncewell	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - The magnitude of change would be **slight**, and the significance of effect would be **moderate/minor**. This would be **not significant**. Year 10 – There would be no change to magnitude or significance in Year 10.
PRoWs and lanes south west between A15 and Brauncewell	Likely effects	It is likely that during operation there would be a medium scale of change to views from various lengths of these footpaths.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 – The magnitude of change is likely to be **moderate** and the likely significance is **major/moderate**. This would potentially give rise to a **significant** effect. Year 10 - The magnitude of change in view is likely to be **moderate** and the significance of effect would be **major/moderate**. This would potentially give rise to a **significant** effect.
Minor Roads to Temple Bruer and Thompsons Bottom Farm	Likely effects	It is likely that during operation there would be a large or medium scale of change to views from various lengths of these roads.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **medium**. Year 1 - The likely magnitude of change in view would be **substantial/moderate** and the significance of effect would be **moderate**. This

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
		would potentially give rise to a **significant** effect. Year 10 - The likely magnitude of change in view would be **moderate** and the significance of effect would be **moderate**. This would potentially remain a **significant** effect.
PRoWs and lanes north west between A15 and Wellingore Heath including New England Lane and Gorse Hill Lane	Likely effects	It is likely that during operation there would be a large or medium scale of change to views from various lengths of these footpaths.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape. Particular attention will be given to mitigating the effects of the Springwell Substation and BESS on these routes and this may involve more structural planting and potentially landform alteration.
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - Adopting a worst case scenario and in the absence of detail regarding Springwell Substation and BESS, the likely magnitude of change in view would potentially be **substantial** and the significance of effect would be **major**. This would potentially give rise to a **significant** effect. Year 10 - Although the magnitude of change and significance of effect is likely to be reduced by mitigation in places, it is likely that **significant** effects on views will remain in the long term.
Spires and Steeples Trail (linear route)	Likely effects	It is likely that during operation there would be a medium scale of change to views along a short section of this trail between Blankney and Scopwick.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **high/medium**.

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
		Year 1 – The magnitude of change is likely to be **moderate/slight** and the likely significance is **moderate**. This would potentially give rise to a **significant** effect. Year 10 - The magnitude of change in view is likely to be **slight** and the significance of effect would be **moderate/minor**. This would be **not significant**.
Ridge and Furrow Trail (linear route)	Likely effects	It is unlikely that there would be any greater than a small scale of change in view from this trail.
	Additional (secondary) mitigation	None required
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - The magnitude of change would be **slight/negligible**, and the significance of effect would be **minor**. This would be **not significant**. Year 10 – There would be no change to magnitude or significance in Year 10.
Viking Way and High Dike (linear route)	Likely effects	It is unlikely that there would be any greater than a small scale of change in view from this trail.
	Additional (secondary) mitigation	None required
	Likely residual effects	The sensitivity of these receptors is **high/medium**. Year 1 - The magnitude of change would be **slight/negligible**, and the significance of effect would be **minor**. This would be **not significant**. Year 10 – There would be no change to magnitude or significance in Year 10.
A15 trunk road (linear route)	Likely effects	It is likely that during operation there would be a large scale of change to views from the A15 between approximately Green Man Lane in the north and Dunston House in the south.

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape. It is assumed that there will be considerable new planting around the new BESS and Springwell Substation.
	Likely residual effects	The sensitivity of these receptors is **low**. Year 1 - The likely magnitude of change in view would be **substantial** and the significance of effect would be **moderate**. This would potentially give rise to a **significant** effect on from the A15 between approximately Green Man Lane in the north and Dunston House in the south. Year 10 - Although the magnitude of change and significance of effect is likely to be reduced by mitigation in places, it is likely that **significant** effects on views will remain in the long term along much of the same section of the road as highlighted above.
B1191 Road) (Heath route) (linear	Likely effects	It is likely that during operation there would be a large scale of change to views from Heath Road close to the junction with the A15 but that beyond Bloxholm Woods there would be no greater than a small or negligible change in the view.
	Additional (secondary) mitigation	A landscape scheme will be developed to integrate the Proposed Development into the receiving landscape.
	Likely residual effects	The sensitivity of these receptors is **medium**. Year 1 - The likely magnitude of change in view would be **moderate** and the significance of effect would be **moderate**. This would potentially give rise to a **significant** effect. Year 10 - The likely magnitude of change in view would be **moderate/slight** and the significance of effect would be **moderate/minor**. This would be **not significant**.

Receptor/matter	Likely effects/additional (secondary) mitigation/residual effects	
B1188 (linear route)	Likely effects	It is unlikely that there would be any greater than a small scale of change in view from this road.
	Additional (secondary) mitigation	None required
	Likely residual effects	The sensitivity of these receptors is **medium**. Year 1 - The likely magnitude of change in view would be **slight** and the significance of effect would be **moderate/minor**. This would be **not significant**. Year 10 - The likely magnitude of change in view would be **negligible** and the significance of effect would be **negligible**. This would be **not significant**.
B1189 (linear route)	Likely effects	It is unlikely that there would be any greater than a negligible scale of change in view from this road.
	Additional (secondary) mitigation	None required
	Likely residual effects	The sensitivity of these receptors is **medium**. The magnitude of change would be **negligible** (tending towards no effect at all), and the significance of effect would also be **negligible**. This would be **not significant**.

9.7. Opportunities for environmental enhancement

9.7.1. As the design of the Proposed Development evolves, localised opportunities for landscape enhancement will be identified and embedded into the final design. The types of opportunities for environmental enhancement which may be brought forward for the DCO application are considered below.

9.7.2. As well as providing visual mitigation, proposed tree and hedgerow planting may enhance the existing landscape fabric and character and contribute to the 'landscape condition/quality' aspect of landscape value.

9.7.3. It is anticipated that new permissive footpaths may be proposed where they would provide improved access by way of connecting

disjointed areas of the network of PRoW; reduce the need to walk along roads without pavements or through areas where there may be difficulties in managing the different requirements of recreation and livestock; or provide improved options for circular walks. These access improvements may contribute to the 'amenity and recreation' aspect of landscape value.

9.7.4. Interpretation may be provided at points of interest along the PRoW network and permissive routes within the Site boundary These may identify information of local landscape, biodiversity and heritage interest. In addition, some interpretation may describe aspects of the Proposed Development itself – primarily in areas where the Proposed Development would be more openly visible. This interpretation may contribute to the 'Cultural heritage' and/or 'Cultural associations' aspects of landscape value.

9.7.5. Measures may be taken to improve access and wayfinding within the Site – which would include mapped and waymarked routes and improvements to stiles, gates and bridges as required, and parking areas. These access improvements may contribute to the 'amenity and recreation' aspect of landscape value.

9.7.6. Biodiversity enhancements may contribute to the 'Natural Heritage' aspect of landscape value.

9.8. Intra-project combined effects

9.8.1. Some of the individual landscape features identified within this preliminary assessment (e.g. existing trees and hedgerows) also have biodiversity value and, in some cases, cultural or heritage value. When considering the significance of landscape effects on any such features, the biodiversity, cultural and heritage values associated with them have been taken into account.

9.8.2. Furthermore, the landscape provides ecosystem services beyond purely the aesthetic and when considering the significance of effects on landscape character any biodiversity, recreational, cultural or heritage values associated with the landscape have been taken into account.

9.8.3. It is recognised that there is the potential for the interaction and combination of residual effects identified in other environmental assessments presented in this PEIR to affect certain visual receptors discussed in this chapter. This could include, for example, effects on residential receptors and/or users of PRoW arising from visual, noise and air quality (dust) impacts. The intra-project combined effects will be considered within the ES once relevant assessments are further progressed.

9.8.4. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

9.9. Difficulties and uncertainties

9.9.1. 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.

9.9.2. There have not been any difficulties or uncertainties in relation to the information presented in this preliminary assessment.

9.10. Further work to inform the ES

9.10.1. This chapter provides preliminary landscape and visual information based on design development of the Proposed Development to date and the data gathered at this point in time. Some of the information gathered will be supplemented and provided in full and final form within the ES.

9.10.2. This PEIR is intended to inform consultation and a more detailed assessment of the effects on identified sensitive receptors will be presented in the ES.

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	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. 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.	Agricultural land classification survey to be undertaken of the proposed cable route location between each parcel. 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.

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	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

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		allied UXO. The risk of UXO will be managed by the 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.	scoped in. However, the Applicant is of the opinion that this matter should remain scoped out of 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	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
		the DCO application. Consultation with the 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	No change – this matter was proposed to be scoped into further assessment within

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		agricultural land during operation of the Proposed Development.	the EIA Scoping Report and the Scoping Opinion has 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)[116] 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)[117] - 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)[118] - 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)[119] - 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

[116] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[117] 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
[118] National Policy Statement for Renewable Energy (EN-3) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[119] 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

be co-located with other functions (for example, onshore wind generation, or storage) to maximise the efficiency of land use.

- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)[120] (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)[121] (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)[122], including paragraph 174.
- Central Lincolnshire Local Plan 2018-2040[123], 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)[124], 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 efficiently[125].

[120] National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011). Available online: 1942-national-policy-statement-electricity-networks.pdf (publishing.service.gov.uk)
[121] Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023). Available online: EN-5 Electricity Networks National Policy Statement (publishing.service.gov.uk)
[122] National Planning Policy Framework (2023). Available online: https://www.gov.uk/government/publications/national-planning-policy-framework--2
[123] https://www.n-kesteven.gov.uk/planning-building/planning/planning-policy/central-lincolnshire-local-plan-2018-2040
[124] LLincolnshire Minerals and Waste Local Plan, Core Strategy and Development Management Policies (2016). Available online: Minerals and waste – Lincolnshire County Council
[125] 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)

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)[126].
- Ministry of Agriculture, Fisheries and Food (MAFF), (1988). Agricultural Land Classification for England and Wales: Revised Guidelines and Criteria for Grading the Quality of Agricultural Land[127]
- Institute of Environmental Management & Assessment (IEMA) Guide: A New perspective on Land and Soil in Environmental Impact Assessment (2022)[128]
- Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile agricultural land, 2nd edition (2012)[129].

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 map[130]– 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 viewer[131].Website provides geological mapping data and copies of scanned historical borehole logs (where available).

[126] Environment Agency. Land Contamination Risk Management (2023). Available online: Phase 1 desktop study contamination survey and investigation services (wessonenvironmental.co.uk)
[127] 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
[128] 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
[129] 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)
[130] Department for Environment, Food and Rural Affairs. MAGIC map (2023). Available online: Magic Map Application (defra.gov.uk)
[131] British Geological Survey. Geology Viewer (2023). Available online: BGS Geology Viewer - British Geological Survey

- Agricultural Land Classification Map East Midlands Region (ALC005)[132].

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.

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

[132] Natural England. Agricultural Land Classification Map: East Midlands Region (ALC005). Available online: [redacted]

- **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 Assessment [133] are defined in **Table 10.4**.

Table 10.4 Land and Soils Receptor sensitivity

Sensitivity (in-situ soils)	Soil resource
Very High	**Biomass production**: ALC Grades 1 & 2 or Land Capability for Agriculture (LCA) Classes 1 & 2 **Ecological habitat, soil biodiversity and platform for landscape**: Soils supporting protected features within a European site (e.g., Special Area of Conservation (SAC), Special Protection Area (SPA), Ramsar); Peat soils; Soils supporting a National Park, or Ancient Woodland **Soil carbon**: Peat soils Soils with potential for ecological/landscape restoration **Soil hydrology**: Very important catchment pathway for water flows and flood risk management

[133] Institute of Environmental Management & Assessment (IEMA) Guide: A New Perspective on Land and Soil in Environmental Impact Assessment (2022). Available online: [redacted]

Sensitivity (in-situ soils)	Soil resource
	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 **Source of materials**: Important surface mineral reserves that would be sterilised (i.e., without future access)
High	**Biomass production**: ALC Grade 3a, or LCA Grade 3.1. **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) **Soil carbon**: Organo-mineral soils (e.g., peaty soils) **Soil hydrology**: Important catchment pathway for water flows and flood risk management **Archaeology, Cultural heritage, Community benefits and Geodiversity**: Soils with probable but as yet unproven (prior to being revealed by construction) archaeological interest; Historic parks and gardens; Regionally Important Geological and 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)
Medium	**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

Sensitivity (in-situ soils)	Soil resource
	Source of materials: surface mineral reserves that would remain accessible for extraction
Low	**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
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions

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	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; • Principal aquifers (within Groundwater Source Protection Zone).
Medium	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; • Principal aquifers (outside of Groundwater Source Protection Zone), Secondary (A, B or undifferentiated) aquifers (within Groundwater Source Protection Zone).

Sensitivity	Criteria guide
Low	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; • 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 Assessment[134].

Table 10.6 Land and soils magnitude of impact

Magnitude of impact (change)	Description of impacts restricting proposed land use
Major	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'*) or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20ha, or gain in soil-related features, as advised by other topic specialists in EIA team (including effects from 'temporary developments'*)
Moderate	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'*) or Potential for improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of between 5 and 20ha, or gain in soil-related features, as advised by other topic specialists in EIA team

[134] Institute of Environmental Management & Assessment (IEMA) Guide: A New Perspective on Land and Soil in Environmental Impact Assessment (2022). Available online: [redacted]

Magnitude of impact (change)	Description of impacts restricting proposed land use
Minor	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. or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of less than 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
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.
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.

Magnitude of impact	Criteria guide
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)[135] 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 pathogens[136].

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

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

[136] 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 certainty137.

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

[137] 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)

- the site had been returned to a satisfactory state, having regard to the state of the site before the facility was put into operation.

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
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 materials[138].

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

[138] 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

there is unlikely to be any change to the baseline position with respect to the land, groundwater or agricultural land classification.

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	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.
	Additional (secondary and tertiary) mitigation	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. 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.
	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

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		significance of the effect is therefore **neutral or slight adverse** and **not significant**.
Groundwater	Likely effects	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. 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).
	Additional (secondary and tertiary) mitigation	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.
	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 of construction activity on groundwater quality would be **negligible** and therefore the significance of effect is considered to be **negligible** and **not significant**.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
Soils and agricultural land	Likely effects	Construction activities, including trafficking of agricultural land by construction vehicles, construction compounds, installation of the cable route and earthworks may lead to compaction 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 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.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
	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 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. The construction phase of works would be audited against the requirements of the SMP by the contractor to ensure adherence.
	Likely residual effects	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**.

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	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.
	Additional (secondary and tertiary) mitigation	There are not shown to be any significant sensitive receptors based on the findings of the Preliminary Risk Assessment, and any 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.
	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**.
Groundwater	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. 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

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		groundwater infiltration rates across the Site. 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.
	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. 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. 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.
	Likely residual effects	The aquifers, particularly in the areas of the Source Protection Zone, are deemed to have a **high** sensitivity. The magnitude of

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		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**.
Soils and agricultural land	Likely effects	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. The Proposed Development will lead to temporary impacts to soil and agricultural land for the duration of the operational 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

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
	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. 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.

Receptor/matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects
	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 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	
Land contamination	Likely effects	Decommissioning activities could lead to minor localised contamination of soils related to potential spills from plant. There is potential for erosion of soils associated with works conducted on steep slopes within the Site boundary. 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.
	Additional (secondary and tertiary) mitigation	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. The decommissioning phase of works would be audited against the requirements of the Outline Decommissioning Environmental Management Plan by the contractor to ensure adherence.
	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

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		considered to be **negligible,** and the significance of the effect is therefore **neutral or slight adverse** and **not significant**.
Groundwater	Likely effects	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. 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).
	Additional (secondary and tertiary) mitigation	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 Environmental Management Plan by the contractor to ensure adherence.
	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

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		effect is considered to be **negligible** and **not significant**.
Soils and agricultural land	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. 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. 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. The trafficking of soils when conditions are unsuitable (e.g., when soils are wet) could damage soil structure necessitating remedial activity to restore quality.
	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 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.

Receptor/Matter	Likely effects/additional (secondary and tertiary) mitigation/residual effects	
		The decommissioning phase of works would be audited against the requirements of the Outline Decommissioning Environmental Management Plan by the contractor to ensure adherence.
	Likely residual effects	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**.

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.

11. Noise and Vibration

11.1. Introduction

11.1.1. This chapter presents the preliminary environmental information and a preliminary assessment of the potential likely significant environmental effects arising from the construction, operation (including maintenance) and decommissioning of the Proposed Development on noise and vibration.

11.2. Consultation, scope and study area

Consultation undertaken to date

11.2.1. An EIA Scoping Report, as provided in **Appendix 4.1**, setting out the proposed noise and vibration 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 noise and vibration in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

11.2.2. **Table 11.1** provides a summary of the consultation activities undertaken in support of the preparation of this preliminary assessment, alongside the EIA Scoping process.

Table 11.18 Summary of consultation undertaken

Consultee	Key matters raised	Actions in response to consultee comments
North Kesteven District Council	Email sent (dated 18.05.23) which outlined the scope of the baseline noise monitoring, proposed monitoring locations and length of survey. Response received from North Kesteven District Council (dated 19.05.23), stating acceptance of the survey monitoring approach with a request to ensure that the proposed baseline monitoring locations are considered in the context of potentially noisy ancillary equipment.	Matters raised by North Kesteven District Council taken into account during baseline noise survey. Locations either at or representative of those nearest sensitive receptors to the Proposed Development adopted for the survey.

Consultee	Key matters raised	Actions in response to consultee comments
North Kesteven District Council	Email sent (dated 18.05.23) which outlined the proposed scope of the noise and vibration assessment. Response received from North Kesteven District Council (dated 19.05.23), stating acceptance of the assessment approach, but provided the following supplementary comments: • For operational noise, North Kesteven District Council would require rating noise levels to be a maximum 5 dB above measured background levels; • The requirement for a Construction Environmental Management Plan, following the outcomes of the construction assessment, in order to outline the Site's approach to dealing with potential complaints and opportunities for mitigation.	Operational noise requirements taken into account for the initial assessment. The relevant BS 4142:20114+A1:2019 also adopts context, utilising the existing baseline environment and absolute noise limits into the assessment. This has also been accounted for in this case. An Outline Construction Environmental Management Plan will be submitted in support of and secured by the DCO.

11.2.3. It is anticipated that further consultation would be required with North Kesteven District Council to review the results of the baseline noise monitoring and seek agreement on appropriate design targets at sensitive receptors during the operational phase.

Scope of the assessment

11.2.4. 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

11.2.5. **Table 11.2** 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 11.19 Receptor/matters scoped out of further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Vibration	Operation	Operational elements including fixed plant items/structures would not emit discernible levels of vibration	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.
Road traffic	Operation	The increase in road traffic during operation is likely to be negligible, with vehicles only likely to be required for routine maintenance	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.
Ecological receptors	Construction, operation and decommissioning	Review of online data sources indicates that there are no Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA), or Ramsar sites adjacent to or at closer distance to the residential locations considered in this preliminary assessment. Therefore, an assessment of noise and vibration impacts on potential ecological receptors has not been considered.	No Change - these receptors were not considered within the EIA Scoping Report, but the Scoping Opinion has requested they be considered. However, the Applicant is of the opinion that these receptors do not need to be considered for further assessment for the reasons outlined in the 'Justification' column.

Receptors/matters scoped into further assessment

11.2.6. **Table 11.3** 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 11.20 Receptor/matters scoped into further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Noise	Construction and decommissioning	Activities likely to involve large earthmoving/lifting plant items with the potential for significant effects to occur.	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.
Noise	Operation	Operational plant items are likely to have an impact on the existing noise environment and affect local amenity.	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.
Road traffic	Construction and decommissioning	Potential increase in HGV/vehicle movements may cause significant effects in the short term.	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.
Vibration	Construction and decommissioning	Activities likely to involve large earthmoving/piling/lifting plant items with the potential for significant effects to occur.	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

11.2.7. The study area for the construction and decommissioning phase assessments considers noise and vibration sensitive receptors that

are located within 300 metres of the Site boundary. This has been determined based on relevant guidance as set out in **Section 11.3** below.

11.2.8. For the assessment of operational phase noise levels, the study area extends out to the nearest or most effected noise sensitive receptors for a single or closely located group of receptors to the Site boundary. Where sensitive receptors are located within a cluster of adjacent properties at similar distance to the Proposed Development, the sensitive receptor position adopted for assessment purposes is considered representative of all the receptors within that cluster.

11.3. Legislative framework, planning policy and guidance

Relevant legislation

11.3.1. Legislation relevant to noise and vibration comprises the following:

- Environmental Protection Act (1990)[139] - Part III of the Environmental Protection Act 1990 contains the mandatory powers available to local authorities within England and Wales in respect of any noise which either constitutes or is likely to cause a statutory nuisance.
- Control of Pollution Act (1974)[140] - The Control of Pollution Act 1974 and the Environmental Protection Act 1990 give local authorities powers for controlling noise and vibration from construction sites and other similar works.

Relevant planning policy

11.3.2. Planning policy relevant to noise and vibration comprises the following:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)[141] provides the basis for decisions regarding nationally significant energy infrastructure. Section 5.11 outlines the planning policy for noise and vibration, including the adoption of relevant standards, the decision making process and opportunities for mitigation.
- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[142] - Section 5.12 outlines the planning

[139] Environmental Protection Act (1990). Available online: https://www.legislation.gov.uk/ukpga/1990/43/contents
[140] Control of Pollution Act (1974). Available online: https://www.legislation.gov.uk/ukpga/1974/40
[141] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[142] 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

policy for noise and vibration, including the adoption of relevant standards, the decision making process and opportunities for mitigation.

- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[143] sets out the policies relating to electricity generation from renewable sources of energy. However, solar farms are not explicitly included within this document.
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[144] - Section 3.10 gives specific consideration to solar development including assessment of noise and vibration impacts.
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2011)[145] - Section 2.9 gives specific consideration for the assessment of noise and vibration impacts.
- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023)[146] - Section 2.10 gives specific consideration to the assessment of noise and vibration impacts, and consideration to mitigation.
- National Planning Policy Framework (NPPF) (September 2023). The NPPF sets out the Government's planning policies for England and how these are expected to be applied. The NPPF includes statements relating to noise and the requirement to take it into account during the planning process.
- Noise Policy Statement for England (NPSE) (Defra, 2010). The NPSE sets out the long-term vision of Government noise policy: to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.
- Planning Practice Guidance – Noise (2019). The Department for Communities and Local Government 'Planning Practice Guidance' (PPG) was published on 6 March 2014 and updated in July 2019. The PPG on Noise expands upon the

[143] National Policy Statement for Renewable Energy (EN-3) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[144] 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
[145] National Policy Statement for Electrical Networks Infrastructure (EN-5) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[146] Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023). Available online: Planning for new energy infrastructure: revisions to National Policy Statements - GOV.UK (www.gov.uk)

NPPF and NPSE and sets out more detailed guidance on noise assessment. Like the NPPF and NPSE, the guidance does not include any specific noise levels but sets out further principles that should underpin an assessment.

- Central Lincolnshire Local Plan – Adopted April 2023. The following policies outlined in **Table 11.4** are applicable to noise.

Table 11.4 Central Lincolnshire Local Plan Adopted April 2023, Noise Policies

Relevant Planning Policy	Policy Clauses
Section 1.5 Objectives	8. "Pollution: To minimise pollution (air, noise and light) and improve air quality.
Policy S14: Renewable Energy	Proposals for renewable energy schemes, including ancillary development, will be supported where the direct, indirect, individual and cumulative impacts on the following considerations are, or will be made, acceptable. To determine whether it is acceptable, the following tests will have to be met: … iii. The impacts are acceptable on the amenity of sensitive neighbouring uses (including local residents) by virtue of matters such as noise, dust, odour, shadow flicker, air quality and traffic;
8.2 Accessibility and Transport	Theme 4 – Supporting safety, security and a healthy lifestyle … C) reduce the impacts of air quality, noise and light pollution
Policy S53: Design and Amenity	C) Not result in adverse noise and vibration taking into account surrounding uses nor result in adverse impacts upon air quality from odour, fumes, smoke, dust and other sources

Applicable guidance

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

BS 4142:2014+A1:2019 - Methods for Rating and Assessing Industrial and Commercial Sound

11.3.4. BS 4142 provides a method for rating industrial and commercial sound and a method for assessing resulting impacts upon people.

The method is applicable to fixed plant installations, sound from industrial and manufacturing processes and other associated operational activities.

11.3.5. The rating method takes into account specific source characteristics, such as tonality, impulsivity and intermittency which are more likely to give rise to disturbance. The impact assessment procedure described in BS 4142 is based on the comparison of the rating sound level with the background sound level prevailing at the assessment locations.

BS 5228-1:2009+A1:2014 - Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise

11.3.6. BS 5228-1 gives recommendations for basic methods of noise control relating to construction work. It also provides guidance concerning methods of predicting and measuring noise and assessing its impact on those exposed to it. The prediction method considers the noise emission level of the plant, the separation distance between the source and the receiver and the effect of the intervening topography and structures.

BS 5228-2:2009+A1:2014 - Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration

11.3.7. BS 5228-2 provides guidance on vibration levels that can be used to assess the likely impacts of construction activities. The standard gives guidance on the significance of vibration effects in terms of human response to vibration and the structural response from affected buildings.

BS 7445-1:2003 - Description and measurement of environmental noise - Guide to Quantities and Procedures

11.3.8. BS 7445 defines the basic quantities to be used for the description of noise in community environments and describes basic procedures for the determination of these quantities.

BS EN 60942:2018 - Electroacoustics – Sound Calibrators

11.3.9. BS EN 60942 specifies the acoustic performance requirements for sound calibrators deployed during noise surveys.

BS EN 61672-1:2013 - Electroacoustics – Sound Level Meters

11.3.10. BS EN 61672 specifies the electroacoustic performance specifications for sound measuring instruments deployed during noise surveys.

Calculation of Road Traffic Noise Memorandum, 1988

11.3.11. Calculation of Road Traffic Noise (CRTN) sets out standard procedures for calculating noise levels from road traffic. The calculation method uses a number of input parameters, including traffic flow volume, average vehicle speed and percentage of heavy duty vehicles, to predict the $L_{A10,18hour}$ or $L_{A10,1hour}$ noise level.

Design Manual for Roads and Bridges, LA 111 Noise and Vibration (2019)

11.3.12. The Design Manual for Roads and Bridges (DMRB) LA 111 'Noise and Vibration' provides guidance on the assessment of noise and vibration impacts due to road traffic. LA 111 includes an impact magnitude criteria for changes in road traffic noise occurring during construction and operational phases, which is applicable across a range of projects.

Institute of Environmental Management & Assessment (IEMA), Guidelines for Environmental Impact Assessment

11.3.13. The IEMA Guidelines for Environmental Impact Assessment address the key principles of noise impact assessment and are applicable to all development proposals where noise effects are likely to occur. The guidelines provide specific support on how noise impact assessment fits within the EIA process.

ISO 9613-2:1996 - Acoustics. Attenuation of Sound During Propagation Outdoors. Part 2: General Method of Calculation

11.3.14. ISO 9613-2 specifies an engineering method for calculating the attenuation of sound during outdoor propagation conditions. The methodology accounts for a number of physical effects including geometrical divergence, atmospheric absorption, ground effects, reflections from surfaces, and screening by obstacles.

World Health Organisation (WHO), Guidelines for Community Noise

11.3.15. The WHO Guidelines for Community Noise provide general guidance and guidelines which have been set for different health effects, using the lowest noise level that produces an adverse health effect in specific human environments.

World Health Organisation (WHO), Night Noise Guidelines for Europe

11.3.16. The WHO Night Noise Guidelines were published in 2009 and present the conclusions of the WHO working group responsible for preparing guidelines for exposure to noise during sleep to protect the public from adverse health effects.

11.4. Methodology

Data sources to inform baseline characterisation

11.4.1. The baseline conditions of the Site have been established via the following sources which determined the scope of the baseline noise monitoring and location of those nearest noise sensitive receptors to the Site boundary:

- Aerial photography and mapping; and
- Project plans (**Figure 2.3**).

Surveys to inform baseline characterisation

11.4.2. A baseline noise survey has been undertaken to establish the prevailing acoustic environment at noise sensitive receptors situated at representative positions within the Site boundary and at off-site positions. The results of the noise survey have been used to inform the preliminary construction and operational phase assessments for the Proposed Development.

11.4.3. The baseline noise survey comprised unattended noise monitoring at 24 locations, as defined in **Table 11.5** and outlined in **Figure 11.1**, which accounted for the surrounding noise sensitive receptors in the vicinity of the Proposed Development. Where field IDs are noted, these are provided in **Figure 2.3**.

11.4.4. Monitoring positions were chosen based on the location of the nearest sensitive receptors to the Site boundary. Where positions are located adjacent to a cluster of properties, the monitoring data is considered representative of all the receptors within that cluster. This is considered based on the existing noise environment. The baseline noise survey was undertaken between 6 June 2023 and 19 July 2023.

Table 11.5 Baseline noise measurement locations

Reference	Grid reference	Description
P1	501375E 356226N	North-west of field ID Tb1 - situated ~190 metres from Gorse Hill Farm, off Gorse Hill Lane
P2	502111E 355010N	West of field ID Bcd098 - situated ~230 metres from No. 1 Thompson's Bottom
P3	501953E 353815N	West of field ID Tb3 - situated ~1.1km from Roadside Cottages, Brauncewell
P4	503616E 352045N	East of field ID W2 - situated ~60m from School Row, Brauncewell
P5	504562E 352652N	East of field ID E1a - situated ~190m from Manor House, Brauncewell

Reference	Grid reference	Description
P6	504300E 353894N	East of field ID Bcd120 – situated ~340m from Mount Farm, Ashby de la Launde
P7	503763E 354142N	East of field ID Bcd118 – situated ~10m from Slate House Cottages, Ashby de la Launde
P8	502914E 355244N	North-east of field ID Bcd099 – situated ~20m from Ashby Lodge Cottages, Ashby de la Launde
P9	504528E 356393N	South-east of field ID Bcd076 – situated ~20m from Linnet Court, Ashby de la Launde
P10	505027E 356240N	North-east of field ID Bcd079 – situated ~10m from Howard Road, Ashy de la Launde
P11	505276E 356809N	West of field ID Bk01 – situated ~ 40m from Digby Lodge, Ashby de la Launde
P12	505574E 356421N	North-east of field ID Rw12 – situated ~ 230m from The Hayloft, Ashby de la Launde
P13	505199E 355578N	South of field ID Rw10 – situated ~100m from The Garden House, Ashby de la Launde
P14	505779E 357404N	North-east of field ID Bk03 – situated ~215m from Scopwick Mill, Scopwick
P15	506701E 358119N	South of field ID B1 – situated ~35m from The Granaries, Scopwick
P16	506930E 357670N	East of field ID Bk17 – situated ~260m from Almonds Green, Scopwick
P17	507084E 356951N	South-east of field ID Bk10 – situated ~120 from Westfield Cottage, Scopwick
P18	506975E 358325N	South-east of field ID Md05 – situated ~140m from Vicarage Lane, Scopwick
P19	506955E 359792N	East of field ID C1 – situated ~70m from Hall Gardens Cottage, Blankney
P20	507242E 360414N	North-west of field ID By01 - situated ~45m from Lane Cottages, Blankney
P21	508383E 360403N	South of field ID By05 – situated ~180m from Brickyard Farm, Blankney
P22	508497E 358982N	North of field ID Lf09 - situated ~15m from Scopwick Low Field Farm, Scopwick
P23	509222E 358029N	South of field ID Lf10 – situated 20m from Sandbach Cottage, Kirkby Green (off Scargate Lane)
P24	508392E 358139N	South of field ID C10 – situated ~200m from Main Street, Kirkby Green

11.4.5. The noise surveys were carried out using Class 1 sound level meters and calibrator conforming to the requirements of BS EN 61672 and BS EN 60942 respectively. The meters had been calibrated to traceable standards within the preceding two years and the calibrator within the previous 12 months. The sound level meters were field calibrated once set up in the measurement positions and on completion of the survey. No significant calibration drift was observed, i.e. within a +/- 0.5 dB tolerance.

11.4.6. The noise monitoring equipment at all positions was located at least 3.5 metres from any significant reflective surfaces, other than the ground. All measurements were taken with the microphone situated approximately 1.5 metres above the local ground level.

Design Assumptions - Operational Phase

11.4.7. **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.

11.4.8. The preliminary design principles and preliminary parameter plans set out the reasonable 'worst case scenario' for noise emissions that has been assessed in this chapter.

11.4.9. A series of design assumptions have been adopted within this preliminary assessment, accounting for those proposed items of plant as detailed within **Chapter 2** and provided in the zonal parameter plan provided in **Figure 2.3**. The design assumptions, in noise terms, relate to the location of fixed plant (where different items of infrastructure will be located within different zones, rather than a specified location), the number of plant items and source noise level for each item of plant. At this stage, the engineering approach is one which allows for maximum flexibility within the design, one which currently accounts for the maximum number of fixed plant items. It is likely that the design would be refined post PEIR submission however, by adopting this approach and using the maximum number of plant items, the parameters considered in this preliminary assessment are considered to represent a reasonable worst case scenario in terms of noise levels. In addition, all items of

plant have been considered as being fully operational during both daytime and night-time periods; again, this approach is likely to be conservative compared to the actual noise levels associated with the Proposed Development. The operational regime is not finalised and will be defined and assessed within the ES.

11.4.10. Potential screening of the BESS has been modelled as part of the optioneering but found to have negligible effect at this stage; it is expected that further mitigation options, discussed in **Table 11.20**, would be refined in detail at a later stage.

11.4.11. **Table 11.7** below provides the reference noise levels, numbers and positioning of plant items utilised within the noise model for the operational phase.

Embedded mitigation measures

11.4.12. 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. 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**.

11.4.13. Those embedded mitigation measures relevant to this preliminary noise and vibration assessment comprise the following:

- The location of infrastructure within separate fields;
- The positioning of equipment away from receptors as far as is reasonably practicable; and
- There will be a minimum 250m offset of central inverters from residential properties.

Assessment Methodology

Construction and decommissioning phase

11.4.14. At this stage, detailed construction and decommissioning methodologies, and plant lists, have not been defined. The detail of noise emitting plant/equipment suitable to inform a full assessment is therefore not available to the extent needed to quantify impacts (and their significance). A qualitative approach has therefore been undertaken, based on experience of similar projects and noise limits (and temporal thresholds) within BS 5228-1:2009+A1: 2014.

11.4.15. Similarly, construction vibration has been assessed in qualitative terms, accounting for the distance between the Site boundary and those nearest sensitive receptors.

11.4.16. Information provided by the project transport team regarding construction traffic flows has been provided. Annual average weekday traffic (AAWT) data has been provided assuming a 2026 construction year; the short-term impact can therefore be derived. Opening year 2026 data is without development, opening year 2026 + construction is inclusive of the development traffic.

11.4.17. Construction traffic count data is provided below:

Table 11.6 Construction traffic count data

Road Link	Road Name	Opening Year 2026		Opening Year 2026 + Construction	
		Flow – AAWT 18hr	%HGV	Flow – AAWT 18hr	%HGV
1	A15 (north of B1191)	14305	10.0	14945	10.1
2	A15 (south of B1191)	15914	9.7	16554	9.8
3	B1191 (between RAF Digby and Ashby de la Launde)	2828	15.4	3708	13.9
4	B1191 (between Scopwick and RAF Digby)	2091	16.3	2971	14.1
5	B1188 (north of Scopwick)	5871	15.1	6511	14.9
6	B1188 (south of Digby)	5042	18.5	5682	17.8
7	A15 (south of Metheringham Heath Lane)	9998	7.2	10638	7.5
8	A15 (north of Leadingham)	11761	7.5	12401	7.8
9	B1188 (south of Scopwick)	4186	4.9	4826	5.9
10	A153 (directly north of junction with A17)	14132	6.2	14772	6.5
11	A17 (between A15 and A153)	22308	16.3	22948	16.2

Operational phase

11.4.18. Operational phase impacts have been predicted using a computer noise model of the Proposed Development layout in **Chapter 2: Description of the Proposed Development**, using SoundPLAN v8.2. The model adopts the calculation method in ISO 9613-2. The noise source(s) may be moving or stationary and the method considers the following major mechanisms of noise attenuation, including geometrical divergence (also known as distance loss or geometric damping), atmospheric absorption, ground effect, reflection from surfaces and screening by obstacles, barriers and buildings.

11.4.19. The ISO 9613-2 method predicts noise levels under meteorological conditions favourable to noise propagation from the sound source to the receptor, downwind propagation or, equivalently, propagation under a moderate ground-based temperature inversion as commonly occurs at night.

11.4.20. Initial details of noise emitting plant/equipment associated with the operational phase fixed plant has been provided by the project team. It should be noted that the final equipment supplier and selection has not yet been confirmed. However, those inputs currently available are sufficient to inform potential impacts for the purposes of this preliminary assessment.

11.4.21. It is anticipated that different plant items would have varying operational regimes, dependent on the level of daylight. For the purposes of this preliminary assessment, plant items have assumed to be 100% operational at all times as a reasonable worst-case.

11.4.22. Noise inputs for the preliminary operational assessment account for the following items:

Table 11.7 Reference noise levels

Equipment	Location	Assumptions	Reference noise level
BESS containers	BESS compound	1150 no. in total	70 dB(A) at 1 metre
BESS transformers	BESS compound	385 no. in total	70 dB(A) at 1 metre
Main transformers	Collector compounds and Springwell substations	4 no. in collector compound areas, 6 no.in Springwell substation	80 dB(A) at 1 metre
Central inverters (ITS)	Within each PV field	5 no. per PV field	65 dB(A) at 10 metres

Equipment	Location	Assumptions	Reference noise level
ITS transformers	Within each PV field	5 no. per PV field	70 dB(A) at 1 metre
String inverters	Within each PV field	44 no. per PV field (with ITS transformer option)	69 dB(A) at 1 metre

11.4.23. It is expected that operation of the Site would likely emit tonal components that may be audible at sensitive receptors, particularly at those sensitive receptors located at nearest distance to the BESS and substation areas. Appropriate tonal corrections have been applied based on the audibility of the source against the residual noise levels. Corrections have been applied:

- +2 dB applied where the specific noise source increases the residual noise level by up to and including 2 dB (classed as 'just perceptible');
- +4 dB applied where the specific noise source increases the residual noise level by 3 to 4 dB (classed as 'clearly perceptible');
- +6 dB applied where the specific noise source increases the residual noise level by 5 dB or more (classed as 'highly perceptible').

11.4.24. This approach complies with the requirements of BS 4142:2014+A1:2019.

11.4.25. Based on experience with similar projects, it is envisaged that the plant items would not emit impulsive or intermittent components.

11.4.26. At this stage, flexibility on the location of the BESS is retained. One option is to position the BESS within the northern fields of Springwell West (adjacent to the Springwell Substation). The second option is to position the BESS within the southern fields of Springwell West, adjacent to Bloxholm Woods. Both options have been assessed for purposes of this preliminary assessment.

11.4.27. The preliminary assessment accounts for the BESS positioned within either the northern or southern fields, plus inclusion of both inverter options. The inverter options include either the use of the string inverters or central inverters. The scenarios within the assessment are as follows:

- Option 1a – Northern BESS + string inverters + ITS transformers;
- Option 1b – Northern BESS + central inverters + ITS transformers;

- Option 2a – Southern BESS + string inverters + ITS transformers;
- Option 2b – Southern BESS + central inverters + ITS transformers.

Receptor sensitivity

11.4.28. Receptor sensitivity has been categorised for a range of receptor types, which has been informed from guidance contained in the following documents:

- DMRB LA 111 'Noise and Vibration'; and
- IEMA document 'Guidelines for Environmental Noise Impact Assessment'.

11.4.29. Receptors will remain within their designated classification regardless of the distance away from the Proposed Development.

Table 11.8 Receptor sensitivity

Receptor Sensitivity	Type of Receptor
High	Residential properties, educational establishments, hospitals, places of worship, hotels, children's nurseries, nursing homes.
Medium	Commercial premises including offices, halls, public municipal areas, bars and restaurants.
Low	Industrial premises.
Negligible	All other areas such as those used primarily for agricultural purposes.

Magnitude of impact

11.4.30. The magnitude of the impact has been described using the following scale:

- High;
- Medium;
- Low; and
- Negligible.

11.4.31. Although the lowest measure of magnitude of impact is defined as 'Negligible', it should be noted that noise and vibration levels may still be audible/perceptible during the construction and operational phases.

11.4.32. The criteria in **Table 11.9** have been adopted for the assessment of magnitude of impact. The criteria have been developed based on the guidance referenced within **Section 11.3**.

Table 11.9 Magnitude of impact criteria

Impact	Magnitude Criteria			
	Negligible	Low	Medium	High
Construction and decommissioning phases – daytime noise (BS 5228-1:2009+A1: 2014)	Less than 55 dB $L_{Aeq,T}$	Between 55 and 65 dB $L_{Aeq,T}$	Between 66 and 75 dB $L_{Aeq,T}$	Greater than 75 dB $L_{Aeq,T}$
Construction and decommissioning phases – night-time noise (BS 5228-1:2009+A1: 2014)	Less than 40 dB $L_{Aeq,T}$	Between 40 and 45 dB $L_{Aeq,T}$	Between 46 and 55 dB $L_{Aeq,T}$	Greater than 55 dB $L_{Aeq,T}$
Construction phase and decommissioning - road traffic noise (DMRB LA 111 'Noise and Vibration')	Less than 1 dB increase in road traffic noise	1.0 to 2.9 dB increase in road traffic noise	3.0 to 4.9 dB increase in road traffic noise	Greater than or equal to 5 dB increase
Construction and decommissioning phases – vibration (BS 5228-2:2009+A1: 2014)	Less than 0.3 mm/s PPV	0.3 to less than 1.0 mm/s PPV	1.0 to 9.9 mm/s PPV	Greater than or equal to 10 mm/s PPV
Operational phase – daytime noise (BS 4142: 2014 + A1: 2019 / WHO, 1999 / BS 8233: 2014)	Rated noise level equal to or less than 35 dB $L_{Ar,T}$	Rated noise level between 36 and 40 dB $L_{Ar,T}$	Rated noise level between 41 and 50 dB $L_{Ar,T}$	Rated noise level greater than 50 dB $L_{Ar,T}$
Operational phase – night-time noise (BS 4142: 2014 + A1: 2019 / WHO, 1999 / BS 8233: 2014)	Rated noise level equal to or less than 30 dB $L_{Ar,T}$	Rated noise level between 31 and 35 dB $L_{Ar,T}$	Rated noise level between 36 and 45 dB $L_{Ar,T}$	Rated noise level greater than 45 dB $L_{Ar,T}$

Notes: *Operational phase noise criteria are based on rated noise levels as defined in BS 4142: 2014+A1: 2019*.

11.4.33. With regards to the operational magnitude criteria, BS 4142 advises that where rating levels and background levels are low, which is typically the case in rural areas, the assessment of operational noise should take into context the absolute noise level. The ANC Guide to BS 4142 provides context to this by stating:

"BS 4142 does not define 'low' in the context of background sound levels nor rating levels. The note to the Scope of the 1997 version of BS 4142 defined very low background sound levels as being less than about 30 dB LA90, and low rating levels as being less than about 35 dB $L_{Ar,Tr}$".

11.4.34. The ANC Guide suggests that: *"…similar values would not be unreasonable in the context of BS 4142, but that the assessor should make a judgement and justify it where appropriate".*

11.4.35. In this case, it is considered that a minimum rating level of 40 dB $L_{Ar,Tr}$ during the daytime, and 35 dB $L_{Ar,Tr}$ for the low magnitude impact criteria, would align with guidance in PPG, which defines noise below the lowest observed adverse effect level (LOAEL) as follows:

"Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life".

11.4.36. Based on the measured baseline noise levels, residual noise levels ($L_{Aeq,\ T}$) are equal to or less than the applied rating level design targets applied to the low magnitude criteria. This is considered to successfully apply the concepts of a lowest observed adverse effect level (LOAEL) within PPG and 'context' within BS 4142.

11.4.37. Furthermore, BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' and the World Health Organisation (WHO) 'Guidelines for Community Noise' (1999) provide guidance levels for internal noise within dwellings of 30 dB $L_{Aeq,T}$ for good sleeping conditions at night. However, residents are likely to be inside their properties at night. BS 8233:2014 states that building envelope attenuation would be reduced by approximately 15 dB for a partially open window. Consequently, an external high magnitude criteria, indicating a significantly adverse effect level (SOAEL) of 45 dB $L_{Ar,Tr}$ has been adopted for the night-time.

11.4.38. Based on the adaptation of absolute limits, WHO 1999 provides their guidance on permissible levels above which adverse effects are likely to occur. Therefore, the criteria for LOAEL and SOAEL adopted within this assessment are considered as a design limit, above which the onset of LOAEL and SOAEL would occur.

Significance of effects

11.4.39. The overall significance of an effect is determined by combining the sensitivity of the receptor and the magnitude of impact (as presented in **Table 11.9**). The assessment of significance relies on best practice, the relevant published standards and guidance documents, and professional judgement.

11.4.40. The significance of an effect is reported as either 'significant' or 'not significant'. Where effect is assessed as 'Negligible' or 'Minor', this is considered to achieve the lowest observed adverse effect level (LOAEL) within NPSE and is considered not significant. Where the effect is classed as 'Moderate' or 'Major', this is considered to apply achieve the significant observed adverse effect level (SOAEL) and is classed as significant.

Table 11.10 Determining significance of effects

Magnitude of impact	Sensitivity of receptor/receiving environment to change			
	High	Medium	Low	Negligible
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

11.5. Summary of baseline conditions

11.5.1. **Table 11.11** presents the results of the baseline noise survey undertaken at representative positions, indicative of those nearest receptors to the Proposed Development. **Table 11.11** also provides the representative background sound level for the daytime and night-time periods following a statistical analysis undertaken in accordance with BS 4142.

11.5.2. The data is presented for both daytime (07:00 – 23:00) and night-time (23:00 – 07:00) periods. Representative background sound levels incorporate the time periods derived from BS 4142, specifically 1-hour for daytime (dB $L_{A90,\ 1hr}$) and 15-minutes for night-time (dB $L_{A90,\ 15min}$).

11.5.3. Weather conditions for the monitoring period have been analysed for the nearest weather station to the Proposed Development, located 1.6km to the south-west of Ashby de la Launde (Wunderground ID – ILINCO209). Where the weather conditions

are considered outside of the parameters for environmental noise monitoring (in accordance with the requirements of BS 7445-1:2003), the corresponding noise data has been discarded from the resultant analysis.

Table 11.11 Measured noise levels

Ref.	Time period	Measured noise levels		Representative background sound level, dB $L_{A90, T}$
		dB $L_{Aeq, T}$	dB $L_{A90,T}$	
MP1	Daytime	46	39	34
MP1	Night-time	43	33	29
MP2	Daytime	49	44	40
MP2	Night-time	45	36	30
MP3	Daytime	49	40	35
MP3	Night-time	48	33	26
MP4	Daytime	53	47	43
MP4	Night-time	50	34	26
MP5	Daytime	44	34	31
MP5	Night-time	35	28	22
MP6	Daytime	45	38	35
MP6	Night-time	41	31	24
MP7	Daytime	44	35	30
MP7	Night-time	43	29	22
MP8	Daytime	52	43	37
MP8	Night-time	53	35	27
MP9	Daytime	43	33	31
MP9	Night-time	38	28	20

Ref.	Time period	Measured noise levels		Representative background sound level, dB $L_{A90, T}$
		dB $L_{Aeq, T}$	dB $L_{A90,T}$	
MP10	Daytime	50	34	30
MP10	Night-time	43	28	21
MP11	Daytime	51	39	36
MP11	Night-time	48	33	26
MP12	Daytime	48	33	32
MP12	Night-time	40	27	22
MP13	Daytime	46	37	33
MP13	Night-time	41	29	23
MP14	Daytime	44	31	28
MP14	Night-time	36	26	22
MP15	Daytime	60	43	38
MP15	Night-time	53	31	25
MP16	Daytime	50	40	36
MP16	Night-time	42	32	24
MP17	Daytime	47	37	33
MP17	Night-time	41	28	22
MP18	Daytime	50	39	35
MP18	Night-time	48	29	22
MP19	Daytime	51	40	36
MP19	Night-time	42	30	23

Ref.	Time period	Measured noise levels		Representative background sound level, dB $L_{A90, T}$
		dB $L_{Aeq, T}$	dB $L_{A90,T}$	
MP20	Daytime	52	39	37
MP20	Night-time	45	31	24
MP21	Daytime	49	35	33
MP21	Night-time	39	27	20
MP22	Daytime	47	35	31
MP22	Night-time	45	26	20
MP23	Daytime	53	34	33
MP23	Night-time	47	25	19
MP24	Daytime	44	33	31
MP24	Night-time	35	25	19

11.5.4. Baseline monitoring positions are provided in **Figure 11.1**.

Sensitive receptors

11.5.5. The following sensitive receptors have been scoped into this preliminary assessment. In most cases, those identified receptors represent a number of dwellings adjacent or within close proximity to one another. It can therefore be reasonably assumed that impacts on the identified receptors will be consistent with that likely to be experienced at those dwellings at a similar distance to the Proposed Development.

11.5.6. Given all receptors are residential, these are considered of **high** sensitivity.

Table 11.12 Sensitive receptors

Ref.	Receptor name	Grid reference	Type	Representative baseline monitoring location
R1	Gorse Hill Farm	501142E 356220N	Residential	MP1

Ref.	Receptor name	Grid reference	Type	Representative baseline monitoring location
R2	The Bungalow, Gorse Hill Road	501187E 356279N	Residential	MP1
R3	14 Martin Court, Mallory Road, RAF Digby	504548E 356395N	Residential	MP9
R4	13 Howard Road, RAF Digby	504935E 356264N	Residential	MP10
R5	Rowston Cottages, Digby	505134E 356539N	Residential	MP10
R6	The Lodge, Digby	505230E 356823N	Residential	MP11
R7	Scopwick Mill	505726E 357614N	Residential	MP15*
R8	Mill Cottages, Scopwick	506022E 357800N	Residential	MP15*
R9	52 Heath Road, Scopwick	506333E 357975N	Residential	MP15
R10	52 Heath Road, Scopwick	506536E 357992N	Residential	MP15
R11	1 Vicarage Lane, Scopwick	506762E 358170N	Residential	MP15
R12	Scopwick House, Scopwick	506654E 358356N	Residential	MP15
R13	The Old Rectory, Blankney	506498E 359782N	Residential	MP19
R14	The Hall Cottage, Blankney	506961E 359869N	Residential	MP19
R15	Hall Farm, Blankney	507194E 359883N	Residential	MP19
R16	Staging Post, Blankney	507085E 360293N	Residential	MP20
R17	Brickyard Farm, Blankney	508565E 360433N	Residential	MP21

Ref.	Receptor name	Grid reference	Type	Representative baseline monitoring location
R18	Scopwick Low Field Farm, Kirkby Green	508483E 359008N	Residential	MP22
R19	The Mills, Kirkby Green	508935E 358036N	Residential	MP23
R20	Harefield, Kirkby Green	508412E 357924N	Residential	MP24
R21	Braemar Residential Park, Kirkby Green	508129E 358088N	Residential	MP24
R22	Longfields, Scopwick	507524E 358118N	Residential	MP24
R23	4 Springfield Estate, Scopwick	507164E 358213N	Residential	MP18
R24	1 Glebe Close, Scopwick	506911E 358169N	Residential	MP18
R25	6 Farriers Court, Scopwick	506749E 358097N	Residential	MP15
R26	35 Beckside, Scopwick	506505E 357912N	Residential	MP15
R27	4 Almonds Court, Scopwick	506799E 357910N	Residential	MP15
R28	Sheffield House, Scopwick	506855E 356719N	Residential	MP17
R29	The Hayloft, Rowston Top	505677E 356209N	Residential	MP13**
R30	Glebe Farm, Digby	504951E 355916N	Residential	MP10
R31	The Garden House, Digby	505312E 355565N	Residential	MP13
R32	The Lodge, Ashby de la Launde	504842E 355323N	Residential	MP13
R33	Slate House, Ashby de la Launde	503882E 354330N	Residential	MP7

Ref.	Receptor name	Grid reference	Type	Representative baseline monitoring location
R34	Mount Farm, Ashby de la Launde	504627E 353753N	Residential	MP6
R35	Peacock Lodge Cottages, Ashby de la Launde	503975E 353647N	Residential	MP6
R36	Hill Farm Cottages, Brauncewell	505570E 353213N	Residential	MP5
R37	Manor House, Brauncewell	504643E 352461N	Residential	MP5
R38	Church House, Brauncewell	504342E 352505N	Residential	MP5
R39	School Row, Brauncewell	503629E 352118N	Residential	MP4
R40	7 Thompson's Bottom, Ashby de la Launde	501857E 354947N	Residential	MP2
R41	1 Thompson's Bottom, Ashby de la Launde	501880E 355053N	Residential	MP2
R42	Ashby Lodge, Ashby de la Launde	502886E 355273N	Residential	MP8
R43	Toll Bar Cottages, Ashby de la Launde	502694E 355720N	Residential	MP8

** Sound level meter at nearest baseline monitoring position 14 found to be on its side on retrieval. Alternative monitoring position used and considered representative; ** Sound level meter at nearest baseline monitoring position 12 found to be on its side on retrieval. Alternative monitoring position used and considered representative.*

11.5.7. The respective locations of the sensitive receptors adopted for the purposes of this preliminary assessment are shown on **Figure 11.2**.

Future baseline

11.5.8. On the basis that the majority of the Proposed Development is located within a rural setting, typically comprising agricultural land use and not located close to major transport infrastructure, there is

generally not expected to be significant changes to the baseline conditions in the future.

11.5.9. Regarding transport infrastructure, such as roads and rail lines, there is potential for growth in the traffic flows in the future baseline scenario. In the absence of significant alterations to the wider road or rail network, the variation in traffic flows would be expected to be incremental and therefore unlikely to give rise to perceptible changes in the acoustic environment.

11.6. Likely effects, additional mitigation and residual effects

Construction phase

11.6.1. **Table 11.13** below summarises the potential impacts of construction phase traffic associated with the Proposed Development.

Table 11.13 Construction traffic – noise level change

Road Link	Road name	Short term noise level change, dB $L_{A10,18hr}$
1	A15 (north of B1191)	0.2
2	A15 (south of B1191)	0.2
3	B1191 (between RAF Digby and Ashby de la Launde)	1.0
4	B1191 (between Scopwick and RAF Digby)	1.2
5	B1188 (north of Scopwick)	0.4
6	B1188 (south of Digby)	0.4
7	A15 (south of Metheringham Heath Lane)	0.3
8	A15 (north of Leadingham)	0.3
9	B1188 (south of Scopwick)	0.8
10	A153 (directly north of junction with A17)	0.2
11	A17 (between A15 and A153)	0.1

11.6.2. Noise predictions indicate that the effect of construction traffic would increase noise levels by a maximum of 1.2 dB $L_{A10, 18hr}$ in the short term along B1191 (between Scopwick and RAF Digby); the

magnitude of impact would be **low**, resulting in a temporary **minor adverse** effect, which is considered **not significant**.

11.6.3. **Table 11.14** below summarises the potential effects during the construction phase.

Table 11.14 Assessment of likely effects, additional mitigation and residual effects during construction

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
Construction noise	Likely effects	Construction activities could lead to noise levels generated by the construction phase activities resulting in potential disturbance or interference with activities. It is noted that such activities are likely considered transient due to the movement of plant and machinery.
	Additional (secondary and tertiary) mitigation	Best Practicable Means (BPM) as defined by the Control of Pollution Act 1974 will be implemented which will serve to minimise the noise and vibration impacts at receptors in the vicinity of the construction phase works. These include (amongst others): • Careful selection of plant and construction methods. Only plant conforming to relevant national, EU or international standards, directives and recommendations on noise and vibration emissions shall be used; • Design and use of site enclosures, housing and temporary stockpiles, where practicable and necessary, to provide acoustic screening at the earliest opportunity; • Plant and equipment liable to create noise and/or vibration whilst in operation will, as far as reasonably practicable, be located away from sensitive receptors and away from walls reflecting towards sensitive receptors. In addition, noise and vibration management measures would be prescribed in the Outline Construction Environmental Management Plan, will be submitted in support of the DCO application and based on the results of the ES (once plant/programme have been defined).

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
	Likely residual effects	Based on the application of suitable control measures and given the distance between source and receiver, the magnitude of impact at receptors is considered **low**, resulting in a temporary **minor adverse** effect, which is considered **not significant**.
Construction vibration	Likely effects	Vibration generated by certain construction activities, such as impact piling, breaking and/or vibratory compaction, may result in potential disturbance or interference with activities.
	Additional (secondary and tertiary) mitigation	BPM as defined by the Control of Pollution Act 1974 will be implemented which will serve to minimise the noise and vibration impacts at receptors in the vicinity of the construction phase works. These include (amongst others): • Low vibration working methods employed; • Controlling vibration at source; • Apply appropriate offset to building locations.
	Likely residual effects	Based on the application of suitable control measures and given the distance between source and receiver, the magnitude of impact at receptors is considered **low**, resulting in a temporary **minor adverse** effect, which is considered **not significant**.
Construction traffic noise	Likely effects	Increase in daytime noise levels generated by construction traffic resulting in potential disturbance or interference with activities.
	Additional (secondary and tertiary) mitigation	BPM as defined by the Control of Pollution Act 1974 will be implemented which will serve to minimise the noise impacts at receptors in the vicinity of the construction routes and use of proposed compound areas. Traffic routes to be designed as to avoid, where practicable, residential properties situated along minor roads.
	Likely residual effects	The magnitude of impact at receptors is considered **low**, resulting in a temporary

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects
	minor adverse effect, which is considered **not significant**.

Operational phase

11.6.4. As stated in **Section 11.4** above, at this stage, flexibility on the location of the BESS is retained alongside operation of the Springwell Substation.

11.6.5. The assessment accounts for the BESS positioned within either the northern or southern fields, plus inclusion of both inverter options (central or string), as follows:

- Option 1a – Northern BESS + string inverters + ITS transformers;
- Option 1b – Northern BESS + central inverters + ITS transformers;
- Option 2a – Southern BESS + string inverters + ITS transformers;
- Option 2b – Southern BESS + central inverters + ITS transformers.

Predicted Operational Noise Levels – Northern BESS

11.6.6. Rated noise levels, accounting for Options 1a and 1b, are itemised in **Tables 11.15** and **11.16,** with the BESS positioned within the northern fields of Springwell West as detailed in **Figure 2.3**.

Table 11.15 Rated noise levels – Option 1a (Northern BESS + String Inverters + ITS Transformers)

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R1	Gorse Hill Farm	36	38	2	9	-4	3	-14	-7
R2	The Bungalow, Gorse Hill Road	36	38	2	9	-4	3	-14	-7
R3	14 Martin Court, Mallory Road, RAF Digby	37	41	6	21	-3	6	-13	-4
R4	13 Howard Road, RAF Digby	34	38	4	17	-6	3	-16	-7
R5	Rowston Cottages, Digby	38	42	8	21	-2	7	-12	-3
R6	The Lodge, Digby	40	44	4	18	0	9	-10	-1

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R7	Scopwick Mill	35	37	-3	12	-5	2	-15	-8
R8	Mill Cottages, Scopwick	34	36	-4	11	-6	1	-16	-9
R9	52 Heath Road, Scopwick	32	34	-6	9	-8	-1	-18	-11
R10	29 Heath Road, Scopwick	32	33	-6	8	-8	-2	-18	-12
R11	1 Vicarage Lane, Scopwick	31	33	-7	8	-9	-2	-19	-12
R12	Scopwick House, Scopwick	31	33	-7	8	-9	-2	-19	-12
R13	The Old Rectory, Blankney	29	31	-7	8	-11	-4	-21	-14

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R14	The Hall Cottage, Blankney	32	36	-4	13	-8	1	-18	-9
R15	Hall Farm, Blankney	35	38	-1	15	-5	3	-15	-7
R16	Staging Post, Blankney	32	33	-5	9	-8	-2	-18	-12
R17	Brickyard Farm, Blankney	35	38	2	18	-5	3	-15	-7
R18	Scopwick Low Field Farm, Kirkby Green	40	41	9	21	0	6	-10	-4
R19	The Mills, Kirkby Green	28	30	-5	11	-12	-5	-22	-15
R20	Harefield, Kirkby Green	30	33	-1	14	-10	-2	-20	-12

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R21	Braemar Residential Park, Kirkby Green	32	38	1	19	-8	3	-18	-7
R22	Longfields, Scopwick	32	38	1	19	-8	3	-18	-7
R23	4 Springfield Estate, Scopwick	32	34	-3	12	-8	-1	-18	-11
R24	1 Glebe Close, Scopwick	31	33	-4	11	-9	-2	-19	-12
R25	6 Farriers Court, Scopwick	31	33	-7	8	-9	-2	-19	-12
R26	35 Beckside, Scopwick	32	34	-6	9	-8	-1	-18	-11
R27	4 Almonds Court, Scopwick	32	33	-6	8	-8	-2	-18	-12

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R28	Sheffield House, Scopwick	35	38	2	16	-5	3	-15	-7
R29	The Hayloft, Rowston Top	39	43	6	20	-1	8	-11	-2
R30	Glebe Farm, Digby	32	36	2	15	-8	1	-18	-9
R31	The Garden House, Digby	30	34	-3	11	-10	-1	-20	-11
R32	The Lodge, Ashby de la Launde	29	31	-4	8	-11	-4	-21	-14
R33	Slate House, Ashby de la Launde	37	39	7	17	-3	4	-13	-6
R34	Mount Farm, Ashby de la Launde	30	31	-5	7	-10	-4	-20	-14

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R35	Peacock Lodge Cottages, Ashby de la Launde	38	40	3	16	-2	5	-12	-5
R36	Hill Farm Cottages, Brauncewell	20	22	-11	0	-20	-13	-30	-23
R37	Manor House, Brauncewell	25	29	-6	7	-15	-6	-25	-16
R38	Church House, Brauncewell	27	31	-4	9	-13	-4	-23	-14
R39	School Row, Brauncewell	29	30	-14	4	-11	-5	-21	-15
R40	7 Thompson's Bottom, Ashby de la Launde	43	43	3	13	3	8	-7	-2

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R41	1 Thompson's Bottom, Ashby de la Launde	44	44	4	14	4	9	-6	-1
R42	Ashby Lodge, Ashby de la Launde	40	41	3	14	0	6	-10	-4
R43	Toll Bar Cottage, Ashby de la Launde	45	44	8	17	5	9	-5	-1

** Inclusive of rating penalties for potential audible tonal components;*
*** LOAEL aligned with the low magnitude impact criteria i.e 40 dB L_{Ar} daytime, 35 dB L_{Ar} night-time*
**** SOAEL aligned with the high magnitude impact criteria i.e 50 dB L_{Ar} daytime, 45 dB L_{Ar} night-time*

Table 11.16 Rated noise levels – Option 1b (Northern BESS + Central Inverters + ITS Transformers)

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R1	Gorse Hill Farm	36	38	2	9	-4	3	-14	-7
R2	The Bungalow, Gorse Hill Road	37	39	3	10	-3	4	-13	-6
R3	14 Martin Court, Mallory Road, RAF Digby	39	43	8	23	-1	8	-11	-2
R4	13 Howard Road, RAF Digby	36	39	6	18	-4	4	-14	-6
R5	Rowston Cottages, Digby	39	42	9	21	-1	7	-11	-3
R6	The Lodge, Digby	40	45	4	19	0	10	-10	0
R7	Scopwick Mill	35	38	-3	13	-5	3	-15	-7

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R8	Mill Cottages, Scopwick	36	38	-2	13	-4	3	-14	-7
R9	52 Heath Road, Scopwick	35	37	-3	12	-5	2	-15	-8
R10	29 Heath Road, Scopwick	34	36	-4	11	-6	1	-16	-9
R11	1 Vicarage Lane, Scopwick	34	36	-4	11	-6	1	-16	-9
R12	Scopwick House, Scopwick	35	36	-3	11	-5	1	-15	-9
R13	The Old Rectory, Blankney	31	32	-5	9	-9	-3	-19	-13
R14	The Hall Cottage, Blankney	34	37	-2	14	-6	2	-16	-8

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R15	Hall Farm, Blankney	37	40	1	17	-3	5	-13	-5
R16	Staging Post, Blankney	34	35	-3	11	-6	0	-16	-10
R17	Brickyard Farm, Blankney	38	44	5	24	-2	9	-12	-1
R18	Scopwick Low Field Farm, Kirkby Green	43	47	12	27	3	12	-7	2
R19	The Mills, Kirkby Green	33	35	0	16	-7	0	-17	-10
R20	Harefield, Kirkby Green	37	41	6	22	-3	6	-13	-4
R21	Braemar Residential Park, Kirkby Green	39	45	8	26	-1	10	-11	0

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R22	Longfields, Scopwick	38	41	7	22	-2	6	-12	-4
R23	4 Springfield Estate, Scopwick	35	38	0	16	-5	3	-15	-7
R24	1 Glebe Close, Scopwick	33	35	-2	13	-7	0	-17	-10
R25	6 Farriers Court, Scopwick	34	36	-4	11	-6	1	-16	-9
R26	35 Beckside, Scopwick	36	37	-2	12	-4	2	-14	-8
R27	4 Almonds Court, Scopwick	35	37	-3	12	-5	2	-15	-8
R28	Sheffield House, Scopwick	42	45	9	23	2	10	-8	0
R29	The Hayloft, Rowston Top	41	45	8	22	1	10	-9	0

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R30	Glebe Farm, Digby	35	38	5	17	-5	3	-15	-7
R31	The Garden House, Digby	33	37	0	14	-7	2	-17	-8
R32	The Lodge, Ashby de la Launde	33	37	0	14	-7	2	-17	-8
R33	Slate House, Ashby de la Launde	42	46	12	24	2	11	-8	1
R34	Mount Farm, Ashby de la Launde	35	39	0	15	-5	4	-15	-6
R35	Peacock Lodge Cottages, Ashby de la Launde	42	45	7	21	2	10	-8	0
R36	Hill Farm Cottages, Brauncewell	26	30	-5	8	-14	-5	-24	-15

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R37	Manor House, Brauncewell	31	34	0	12	-9	-1	-19	-11
R38	Church House, Brauncewell	32	37	1	15	-8	2	-18	-8
R39	School Row, Brauncewell	34	36	-9	10	-6	1	-16	-9
R40	7 Thompson's Bottom, Ashby de la Launde	43	43	3	13	3	8	-7	-2
R41	1 Thompson's Bottom, Ashby de la Launde	44	47	4	17	4	12	-6	2
R42	Ashby Lodge, Ashby de la Launde	41	42	4	15	1	7	-9	-3

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R43	Toll Bar Cottage, Ashby de la Launde	45	46	8	19	5	11	-5	1

** Inclusive of rating penalties for potential audible tonal components;*
*** LOAEL aligned with the low magnitude impact criteria i.e 40 dB L_{Ar} daytime, 35 dB L_{Ar} night-time*
**** SOAEL aligned with the high magnitude impact criteria i.e 50 dB L_{Ar} daytime, 45 dB L_{Ar} night-time*

11.6.7. Predicted noise levels accounting for Option 1a do not exceed the adopted SOAEL criteria at all sensitive receptors considered. Highest rated noise levels (L_{Ar}) are predicted at R43 – Toll Bar Cottages, daytime noise levels of 45 dB L_{Ar} and night-time levels of 44 dB L_{Ar}.

11.6.8. Predicted noise levels accounting for Option 1b are likely to remain below the adopted SOAEL criteria at all sensitive receptors considered during the daytime, with four exceedances predicted during the night-time. Highest rated noise levels (L_{Ar}) are predicted at R43 – Toll Bar Cottages, daytime noise levels of 45 dB L_{Ar} and night-time levels of 46 dB L_{Ar}.

11.6.9. The results of this preliminary assessment will inform the iterative design and mitigation strategy to be developed with the intention that the Proposed Development will not exceed the adopted LOAEL criteria at sensitive receptors.

11.6.10. **Table 11.17** below summarises the potential noise effects during the operational phase, with the northern BESS options.

Table 11.17 Assessment of likely effects, additional mitigation and residual effects during operation – Northern BESS

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
Option 1a	Likely effects	Noise from operational plant items likely to exceed the LOAEL.
	Additional (secondary and tertiary) mitigation	Implementation/adoption of further acoustic mitigation measures as part of the ongoing design, to include: • Reducing the number of plant items (following engineering review); • Reducing noise at source through refinement of the engineering requirements in order to adopt lower noise emitting operational plant items; • Increasing the distance between source and receiver; • Use of barriers and/or enclosures where possible; and • Refinement of operational regimes to reduce noise impact during the quietest parts of the day (i.e those periods with the lowest residual noise/criteria).

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
	Likely residual effects	Based on the application of suitable control measures, the magnitude of impact at receptors accounting for Option 1a is considered **low**, resulting in a long term **minor adverse** effect, which is considered **not significant**.
Option 1b	Likely effects	Noise from operational plant items likely to exceed the LOAEL for the majority of the receptors considered, with exceedances of the SOAEL during the night at four of the sensitive receptors considered.
	Additional (secondary and tertiary) mitigation	Implementation/adoption of further acoustic mitigation measures as part of the ongoing design, to include: • Reducing the number of plant items (following engineering review); • Reducing noise at source through refinement of the engineering requirements in order to adopt lower noise emitting operational plant items; • Increasing the distance between source and receiver; • Use of barriers and/or enclosures where possible; and • Refinement of operational regimes to reduce noise impact during the quietest parts of the day (i.e those periods with the lowest residual noise/criteria).
	Likely residual effects	Based on the application of suitable control measures, the magnitude of impact at receptors accounting for Option 1b is considered **low**, resulting in a long term **minor adverse** effect, which is considered **not significant**.

Predicted Operational Noise Levels – Southern BESS

11.6.11. Rated noise levels, accounting for Options 2a and 2b, are itemised in **Tables 11.18** and **11.19,** with the BESS positioned within the southern fields of Springwell West as detailed in **Figure 2.3**.

Table 11.18 Rated noise levels – Option 2a (Southern BESS + String Inverters + ITS Transformers)

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R1	Gorse Hill Farm	28	28	-6	-1	-12	-7	-22	-17
R2	The Bungalow, Gorse Hill Road	28	28	-6	-1	-12	-7	-22	-17
R3	14 Martin Court, Mallory Road, RAF Digby	37	40	6	20	-3	5	-13	-5
R4	13 Howard Road, RAF Digby	34	38	4	17	-6	3	-16	-7
R5	Rowston Cottages, Digby	38	42	8	21	-2	7	-12	-3
R6	The Lodge, Digby	40	44	4	18	0	9	-10	-1
R7	Scopwick Mill	35	37	-3	12	-5	2	-15	-8

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R8	Mill Cottages, Scopwick	34	36	-4	11	-6	1	-16	-9
R9	52 Heath Road, Scopwick	32	34	-6	9	-8	-1	-18	-11
R10	29 Heath Road, Scopwick	32	33	-6	8	-8	-2	-18	-12
R11	1 Vicarage Lane, Scopwick	31	33	-7	8	-9	-2	-19	-12
R12	Scopwick House, Scopwick	31	33	-7	8	-9	-2	-19	-12
R13	The Old Rectory, Blankney	29	31	-7	8	-11	-4	-21	-14
R14	The Hall Cottage, Blankney	32	36	-4	13	-8	1	-18	-9

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R15	Hall Farm, Blankney	35	38	-1	15	-5	3	-15	-7
R16	Staging Post, Blankney	32	33	-5	9	-8	-2	-18	-12
R17	Brickyard Farm, Blankney	35	38	2	18	-5	3	-15	-7
R18	Scopwick Low Field Farm, Kirkby Green	40	41	9	21	0	6	-10	-4
R19	The Mills, Kirkby Green	28	30	-5	11	-12	-5	-22	-15
R20	Harefield, Kirkby Green	30	33	-1	14	-10	-2	-20	-12
R21	Braemar Residential Park, Kirkby Green	32	38	1	19	-8	3	-18	-7

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R22	Longfields, Scopwick	32	38	1	19	-8	3	-18	-7
R23	4 Springfield Estate, Scopwick	32	34	-3	12	-8	-1	-18	-11
R24	1 Glebe Close, Scopwick	31	33	-4	11	-9	-2	-19	-12
R25	6 Farriers Court, Scopwick	31	33	-7	8	-9	-2	-19	-12
R26	35 Beckside, Scopwick	32	34	-6	9	-8	-1	-18	-11
R27	4 Almonds Court, Scopwick	32	33	-6	8	-8	-2	-18	-12
R28	Sheffield House, Scopwick	35	38	2	16	-5	3	-15	-7
R29	The Hayloft, Rowston Top	39	43	6	20	-1	8	-11	-2

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R30	Glebe Farm, Digby	32	36	2	15	-8	1	-18	-9
R31	The Garden House, Digby	30	34	-3	11	-10	-1	-20	-11
R32	The Lodge, Ashby de la Launde	31	34	-2	11	-9	-1	-19	-11
R33	Slate House, Ashby de la Launde	41	42	11	20	1	7	-9	-3
R34	Mount Farm, Ashby de la Launde	42	45	7	21	2	10	-8	0
R35	Peacock Lodge Cottages, Ashby de la Launde	50	53	15	29	10	18	0	8
R36	Hill Farm Cottages, Brauncewell	31	34	0	12	-9	-1	-19	-11

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R37	Manor House, Brauncewell	38	41	7	19	-2	6	-12	-4
R38	Church House, Brauncewell	41	46	10	24	1	11	-9	1
R39	School Row, Brauncewell	35	36	-8	10	-5	1	-15	-9
R40	7 Thompson's Bottom, Ashby de la Launde	33	35	-7	5	-7	0	-17	-10
R41	1 Thompson's Bottom, Ashby de la Launde	34	36	-6	6	-6	1	-16	-9
R42	Ashby Lodge, Ashby de la Launde	37	38	0	11	-3	3	-13	-7

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R43	Toll Bar Cottage, Ashby de la Launde	34	36	-3	9	-6	1	-16	-9

** Inclusive of rating penalties for potential audible tonal components;*
*** LOAEL aligned with the low magnitude impact criteria i.e 40 dB L_{Ar} daytime, 35 dB L_{Ar} night-time*
**** SOAEL aligned with the high magnitude impact criteria i.e 50 dB L_{Ar} daytime, 45 dB L_{Ar} night-time*

Table 11.19 Rated noise levels – Option 2b (Southern BESS + Central Inverters + ITS Transformers)

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R1	Gorse Hill Farm	28	28	-6	-1	-12	-7	-22	-17
R2	The Bungalow, Gorse Hill Road	28	28	-6	-1	-12	-7	-22	-17
R3	14 Martin Court, Mallory Road, RAF Digby	39	43	8	23	-1	8	-11	-2
R4	13 Howard Road, RAF Digby	36	39	6	18	-4	4	-14	-6
R5	Rowston Cottages, Digby	39	42	9	21	-1	7	-11	-3
R6	The Lodge, Digby	40	45	4	19	0	10	-10	0
R7	Scopwick Mill	35	38	-3	13	-5	3	-15	-7

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R8	Mill Cottages, Scopwick	36	38	-2	13	-4	3	-14	-7
R9	52 Heath Road, Scopwick	35	37	-3	12	-5	2	-15	-8
R10	29 Heath Road, Scopwick	34	36	-4	11	-6	1	-16	-9
R11	1 Vicarage Lane, Scopwick	34	36	-4	11	-6	1	-16	-9
R12	Scopwick House, Scopwick	35	36	-3	11	-5	1	-15	-9
R13	The Old Rectory, Blankney	31	32	-5	9	-9	-3	-19	-13
R14	The Hall Cottage, Blankney	34	37	-2	14	-6	2	-16	-8

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R15	Hall Farm, Blankney	37	40	1	17	-3	5	-13	-5
R16	Staging Post, Blankney	34	35	-3	11	-6	0	-16	-10
R17	Brickyard Farm, Blankney	38	44	5	24	-2	9	-12	-1
R18	Scopwick Low Field Farm, Kirkby Green	43	47	12	27	3	12	-7	2
R19	The Mills, Kirkby Green	33	35	0	16	-7	0	-17	-10
R20	Harefield, Kirkby Green	37	41	6	22	-3	6	-13	-4
R21	Braemar Residential Park, Kirkby Green	39	45	8	26	-1	10	-11	0

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R22	Longfields, Scopwick	38	41	7	22	-2	6	-12	-4
R23	4 Springfield Estate, Scopwick	35	38	0	16	-5	3	-15	-7
R24	1 Glebe Close, Scopwick	33	35	-2	13	-7	0	-17	-10
R25	6 Farriers Court, Scopwick	34	36	-4	11	-6	1	-16	-9
R26	35 Beckside, Scopwick	36	37	-2	12	-4	2	-14	-8
R27	4 Almonds Court, Scopwick	35	37	-3	12	-5	2	-15	-8
R28	Sheffield House, Scopwick	42	45	9	23	2	10	-8	0

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R29	The Hayloft, Rowston Top	41	45	8	22	1	10	-9	0
R30	Glebe Farm, Digby	35	38	5	17	-5	3	-15	-7
R31	The Garden House, Digby	33	37	0	14	-7	2	-17	-8
R32	The Lodge, Ashby de la Launde	34	38	1	15	-6	3	-16	-7
R33	Slate House, Ashby de la Launde	44	47	14	25	4	12	-6	2
R34	Mount Farm, Ashby de la Launde	43	46	8	22	3	11	-7	1
R35	Peacock Lodge Cottages, Ashby de la Launde	51	54	16	30	11	19	1	9

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R36	Hill Farm Cottages, Brauncewell	32	37	1	15	-8	2	-18	-8
R37	Manor House, Brauncewell	39	44	8	22	-1	9	-11	-1
R38	Church House, Brauncewell	41	46	10	24	1	11	-9	1
R39	School Row, Brauncewell	37	39	-6	13	-3	4	-13	-6
R40	7 Thompson's Bottom, Ashby de la Launde	34	35	-6	5	-6	0	-16	-10
R41	1 Thompson's Bottom, Ashby de la Launde	34	38	-6	8	-6	3	-16	-7

Ref.	Receptor name	Rated noise level, dB L_{Ar}*		Exceedance above representative background sound level, dB		Exceedance above LOAEL, dB**		Exceedance above SOAEL, dB***	
		Daytime	Night	Daytime	Night	Daytime	Night	Daytime	Night
R42	Ashby Lodge, Ashby de la Launde	39	40	2	13	-1	5	-11	-5
R43	Toll Bar Cottage, Ashby de la Launde	36	38	-1	11	-4	3	-14	-7

** Inclusive of rating penalties for potential audible tonal components;*
*** LOAEL aligned with the low magnitude impact criteria i.e 40 dB L_{Ar} daytime, 35 dB L_{Ar} night-time*
**** SOAEL aligned with the high magnitude impact criteria i.e 50 dB L_{Ar} daytime, 45 dB L_{Ar} night-time*

11.6.12. Predicted noise levels accounting for Option 2a are likely to remain below the adopted SOAEL criteria at all sensitive receptors considered during the daytime, with two exceedances predicted during the night-time. Highest rated noise levels (L_{Ar}) are predicted at R35 – Peacock Lodge Cottages, daytime noise levels of 50 dB L_{Ar} and night-time levels of 53 dB L_{Ar}.

11.6.13. Predicted noise levels accounting for Option 2b are likely to exceed the adopted SOAEL criteria during both daytime and night-time periods, with one exceedance predicted during the daytime and five exceedances at sensitive receptors during the night. Highest rated noise levels (L_{Ar}) are predicted at R35 – Peacock Lodge Cottages, daytime noise levels of 51 dB L_{Ar} and night-time levels of 54 dB L_{Ar}.

11.6.14. **Table 11.20** below summarises the potential noise effects during the operational phase, with the southern BESS options.

Table 11.20 Assessment of likely effects, additional mitigation and residual effects during operation – Southern BESS

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
Option 2a	Likely effects	Noise from operational plant items likely to exceed the SOAEL.
	Additional (secondary and tertiary) mitigation	Implementation/adoption of further acoustic mitigation measures as part of the ongoing design, to include: • Reducing the number of plant items (following engineering review); • Reducing noise at source through refinement of the engineering requirements in order to adopt lower noise emitting operational plant items; • Increasing the distance between source and receiver; • Use of barriers and/or enclosures where possible; • Refinement of operational regimes to reduce noise impact during the quietest parts of the day (i.e those periods with the lowest residual noise/criteria).
	Likely residual effects	Based on the application of suitable control measures, the magnitude of impact at receptors accounting for Option 2a is

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
		considered **high**, resulting in a long term **major adverse** effect, which is considered **significant**.
Option 2b	Likely effects	Noise from operational plant items likely to exceed the SOAEL.
	Additional (secondary and tertiary) mitigation	Implementation/adoption of further acoustic mitigation measures as part of the ongoing design, to include: • Reducing the number of plant items (following engineering review); • Reducing noise at source through refinement of the engineering requirements in order to adopt lower noise emitting operational plant items; • Increasing the distance between source and receiver; • Use of barriers and/or enclosures where possible; • Refinement of operational regimes to reduce noise impact during the quietest parts of the day (i.e those periods with the lowest residual noise/criteria).
	Likely residual effects	Based on the application of suitable control measures, the magnitude of impact at receptors accounting for Option 2b is considered **high**, resulting in a long term **major adverse** effect, which is considered **significant**.

11.6.15. Based on the results of the noise modelling, it is recommended that the ongoing design and mitigation of the Proposed Development utilise the optioneering of the BESS within the north fields of Springwell West. The rationale for this is the larger areas of the northern fields with which to position/re-orientate plant and equipment, increased options for potential noise barriers and an increase in distance between source and sensitive receptors.

Decommissioning phase

11.6.16. The likely noise and vibration impacts during the decommissioning phase are considered to be similar to the

construction phase, as it is envisaged that similar plant and works would be used.

Assessment against future baseline

11.6.17. Given the Site's location within a largely rural setting, the future noise and vibration baseline would not significantly change in the absence of the Proposed Development.

11.7. Opportunities for environmental enhancement

11.7.1. Opportunities for environmental enhancement would not be relevant for the purposes of noise and vibration.

11.8. Intra-project combined effects

11.8.1. The effect of construction noise has been found to be of low impact based on current predicted trip generations, such that there is not considered to be a potential for significant in-combination effects associated with this aspect of the Proposed Development. Similarly, the positioning of plant/equipment during the operational phase would not significantly impact the design considerations accounted for within the landscape and visual assessment (**Chapter 9**).

11.8.2. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

11.9. Difficulties and uncertainties

11.9.1. 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.

11.9.2. Two of the survey positions utilised for the baseline monitoring were found to be tampered with on arrival. It has been considered that alternate positions, adjacent to the same likely noise source(s), would be appropriate for purposes of assessment. Discussions with North Kesteven District Council are proposed regarding this approach.

11.9.3. Details of plant/equipment during the construction and decommissioning stages have not been defined. This preliminary assessment of likely effects has therefore been considered in qualitative terms. The final techniques, plant selection and programme are expected to be defined during the preparation of the ES, as further information becomes available.

11.9.4. Details of the noise emitting plant/equipment, their operating scenarios and location, associated with the operational phase have not been finalised at this stage. Further refinement of the design of the Proposed Development would be undertaken in order to ensure compliance with the appropriate design targets.

11.9.5. Consultation has been undertaken with North Kesteven District Council concerning the application of the relevant standards, pertinent to the initial assessment of operational noise. As expected, baseline noise monitoring identified the residual noise environment to be of 'low' order. Further consultation is proposed with North Kesteven District Council to confirm the contextual assessment and application of absolute limits to define the LOAEL and SOAEL, as identified within this preliminary assessment.

11.10. Further work to inform the ES

Surveys

11.10.1. At this stage, no further surveys are anticipated subject to responses received from North Kesteven District Council.

Construction and decommissioning assessment

11.10.2. The following construction and decommissioning phase elements will either be undertaken or refined for the ES:

- Assessment of noise and vibration levels generated by the construction works in accordance with BS 5228. If appropriate, this will include an assessment of construction activities of an impulsive nature against shorter $L_{Aeq,T}$ averaging periods in line with Section 8.5.2.5 of BS 5228-1.
- Further detailed assessment of construction traffic flow fluctuations on the public highway (and private roads) during the various construction phases of the Proposed Development. This will be calculated using the methodology set out in the CRTN publication, using flow data provided by the traffic consultant.
- Assessment of construction traffic on the various temporary site access routes where practicable, using the haul route method outlined in Section F.2.5 of BS 5228-1. The assessment will consider the flow data provided by the traffic consultant.
- Consideration of potential cumulative effects as a result of the Proposed Development in combination with other existing development and/or approved developments.
- The outline scope of construction phase compliance monitoring.

Operational assessment

11.10.3. The following operational phase elements will be undertaken as part of the ES:

- Refinement of the noise prediction model for the operational fixed plant which will account for the proposed and/or revised site layout, noise emitting plant/equipment (preferably in octave bands) to be introduced and any embedded acoustic mitigation measures.
- An operational phase noise assessment for the operational fixed plant undertaken in accordance with the methodology outlined in BS 4142. This will identify the requirement for additional mitigation measures.
- Consideration of potential cumulative effects as a result of the Proposed Development in combination with existing development and/or approved developments, where applicable.

12. Traffic and Transport

12.1. Introduction

12.1.1. This chapter presents the preliminary environmental information and a preliminary assessment of the likely significant environmental effects arising from the construction and decommissioning of the Proposed Development upon traffic and transport.

12.1.2. Due to the extent of baseline information currently known and the maturity of the design of the Proposed Development, it should be noted that this preliminary assessment only considers severance impacts during construction and decommissioning. Assessment of pedestrian delay; amenity; fear and intimidation; driver delay and highway safety will be reported within the ES once further baseline information has been obtained and the design of the Proposed Development has progressed.

12.1.3. As proposed in the EIA Scoping Report and agreed through the Scoping Opinion received, impacts during operation (including maintenance) have not been considered within this preliminary assessment. Refer to **Section 12.2** below for further detail.

12.2. Consultation, scope and study area

Consultation undertaken to date

12.2.1. An Environmental Impact Assessment (EIA) Scoping Report, presented in **Appendix 4.1**, setting out the proposed traffic and transport assessment scope and methodology for the Proposed Development, was submitted to the Planning Inspectorate in March 2023. A Scoping Opinion, presented in **Appendix 4.2**, was issued by the Planning Inspectorate on behalf of the Secretary of State in May 2023 and included responses from Lincolnshire County Council and National Highways, these being the relevant highway authorities. **Appendix 4.3** provides responses to comments relating to traffic and transport in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

12.2.2. The key consultees for this preliminary assessment have been identified as the relevant highway authorities and planning authorities that may be impacted during the construction and decommissioning phase of the Proposed Development. These consultees comprise:

- North Kesteven District Council;
- Lincolnshire County Council; and
- National Highways.

12.2.3. **Table 12.1** provides a summary of the consultation activities undertaken to date in support of the preparation of this preliminary assessment, outside the EIA Scoping process.

Table 12.1 Summary of consultation undertaken

Consultee	Key matters raised	Actions in response to consultee comments
Lincolnshire County Council (Transportation Team)	Initial feedback received at a meeting held on 25th May 2023 suggests that there should not be an absolute constraint in terms of capacity; however, there should be focus on managing the timing of construction activities to minimise impacts on local road networks and communities in the area.	Measures required to control any construction traffic impacts will be documented within and secured by the Outline Construction Traffic Management Plan. The approach to traffic surveys was discussed and the quantity and location of Automatic Traffic Counts (ATC) and Manual Classified Counts (MCC) surveys was agreed.
	The preferred road network to be utilised for construction traffic was discussed in principle.	The usage of the A15, B1191, B1188 was identified. These discussions resulted in the subsequent exclusion of the B1189 and the inclusion of the B1202 in the ongoing assessments relating to construction traffic.

12.2.4. Consultation and engagement with consultees and relevant stakeholders is ongoing, and will continue to inform the design and EIA process.

Scope of the assessment

12.2.5. 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.

12.2.6. As documented in **Appendix 4.2** and **Appendix 4.3**, the scope of the assessment proposed in the EIA Scoping Report has been confirmed as being acceptable to both Lincolnshire County Council and National Highways (the relevant highway authorities). Following an initial site visit and route investigation following the submission of the EIA Scoping Report, it has been proposed to include the B1202 within the study area and exclude the B1189, as

discussed in **Table 12.2** and **Table 12.3** below. No other changes to the scope of the assessment presented in the EIA Scoping Report are proposed.

Receptors/matters scoped out of further assessment

12.2.7. **Table 12.2** 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 12.2 Receptor/matters scoped out of further assessment

Receptor / matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
B-Road B1189	Construction and decommissioning	This route is no longer considered relevant to the assessment as it is not proposed to be used to route construction traffic to working areas, nor is it proposed to access Site during decommissioning.	Change - this receptor was included within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor is now scoped out of further assessment for the reasons outlined in the 'Justification' column.
All	Operation	Once the Proposed Development is operational, the effect on the local road system is expected to be minimal. Access will be required from time to time for routine maintenance, and less frequently for major maintenance and upgrades. Therefore, the changes in traffic on the existing network are not expected to increase by more than 30% for HGVs or 30% for all vehicle movements, these being defining thresholds	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.

Receptor / matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		(IEMA, 2023) for environmental effects on the local transport network.	

Receptors/matters scoped into further assessment

12.2.8. **Table 12.3** 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 12.3 Receptor/matters scoped into further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
B-Road B1202 (A15 to Metheringham)	Construction	This road link has been included based on the findings of the access route optioneering which now includes this link for construction traffic.	Change - this receptor was not considered within the EIA Scoping Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor is now scoped into further assessment for the reasons outlined in the 'Justification' column.
B-Road B1188 (Scopwick to Digby; Scopwick to Metheringham)	Construction	During the construction phase, traffic will be generated by a range of activities including:	No change – these receptors were proposed to be scoped in within the EIA Scoping Report

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
B-Road B1191 (A15 to Scopwick)	Construction	• Construction workers arriving and leaving site areas/ compounds; • Supply of construction materials and plant associated with the establishment of compounds and main construction works; • Movement of plant; • Removal of soil resources, spoil or waste; and • Service vehicles and visitors. Construction traffic estimates are broadly identified. As such, this phase of works is being assessed to enable consideration of likely impacts on receptors within the study area against the 'Environmental Assessment of Traffic and Movement' (Institute of Environmental Management and Assessment (IEMA), 2023)	and the Scoping Opinion has agreed with this approach.
A-Road A15	Construction		
Local (minor) roads (Navenby Lane; Bloxholm Lane; Temple Road; Gorse Hill Road)	Construction		
B-Road B1202	Decommissioning	For the purposes of the EIA, the decommissioning is assumed to be 40	Change - this receptor was not considered within the EIA Scoping

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		years from opening. The decommissioning phase is expected to be similar in duration and nature to the construction phase, albeit with fewer vehicle trips over a slightly shorter duration.	Report, but due to additional information having been obtained since the EIA Scoping Report was submitted, this receptor is now scoped into further assessment for the reasons outlined in the 'Justification' column.
B-Road B1188 (Scopwick to Digby; Scopwick to Metheringham)	Decommissioning		No change – these receptors were proposed to be scoped in within the EIA Scoping Report and the Scoping Opinion has agreed with this approach.
B-Road B1191 (A15 to Scopwick)	Decommissioning		
A-Road A15	Decommissioning		
Local (minor) roads (Navenby Lane; Bloxholm Lane; Temple Road; Gorse Hill Road)	Decommissioning		

Extent of the study area

12.2.9. The assessment considers the impacts of road traffic on the highway network. This will examine relevant junctions and connecting road links, the latter being the primary consideration for assessment of likely significant environmental effects.

12.2.10. The study area, focussing on the construction phase impacts for the reasons outlined above, will comprise the following road links. At this stage, the broad location of access points (as shown in **Figure 12.1**) is known and as such, the following road links will comprise the study area (at the site access points along the Site boundary):

- B1202;
- B1188;
- B1191;
- A15; and
- A small number of local minor roads to serve compounds.

12.2.11. These study area links, as illustrated in **Figure 12.1**, have been identified based on identified construction traffic routes to the Proposed Development, following agreement with stakeholders (North Kesteven Council; Lincolnshire County Council and National Highways as appropriate). These routes will be documented within and secured by the Outline Construction Traffic Management Plan.

12.2.12. The extent of the study area will be refined and agreed through subsequent discussions with the local highway authorities prior to undertaking the assessment for the ES. This will be based on the findings of the preliminary assessment within this chapter and following the agreement of the access locations.

12.3. Legislative framework, planning policy and guidance

Relevant planning policy

12.3.1. This section outlines planning policy relevant to traffic and transport. These policy documents have been reviewed and considered in respect to the Proposed Development, with the aim of contributing to the goals and visions of these documents:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)[147] provides the basis for decisions regarding nationally significant energy infrastructure. Section 5.13 outlines the planning policy for traffic and transport, including guidance on undertaking relevant parts of the EIA.
- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[148] - Section 5.14 outlines the planning

[147] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[148] 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

policy for traffic and transport, including guidance on undertaking relevant parts of the EIA.

- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[149] sets out the policies relating to electricity generation from renewable sources of energy. However, solar farms are not explicitly included within the document.
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3)[150] (2023) - Paragraph 2.54.1 references the requirement for the applicant to assess the various potential routes to the site for delivery of materials and components, where the source of the materials is known at the time considering abnormal loads. This section also refers to mitigation measures such as controlling the number of vehicle movements and consultation with the relevant local highway authority. Consistent with the generic policy set out in NPS EN-1, this section confirms that if there are abnormal loads proposed, that they can be safely transported in a way that minimises inconvenience to other road users and that the environmental effects of this and other construction traffic, after mitigation, are acceptable;
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5)[151] (2011) which provides the primary basis for decisions regarding electricity networks infrastructure;
- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-3)(2023)[152]
- National Planning Policy Framework (NPPF) (September 2023)[153] – no transport related changes applied in the 2023 release;
- Relevant policies of the Central Lincolnshire Local Plan 2018-2040 include the following:
    - Policy S14: Renewable Energy
    - Policy S47: Accessibility and Transport

[149] National Policy Statement for Renewable Energy (EN-3) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[150] Draft National Policy Statement for Renewable Energy (EN-3) (2023). Available online: Planning for new energy infrastructure: revisions to National Policy Statements - GOV.UK (www.gov.uk)
[151] National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011). Available online: National Policy Statements for energy infrastructure - GOV.UK (www.gov.uk)
[152] 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
[153]National Planning Policy Framework (2023). Available online. https://www.gov.uk/government/publications/national-planning-policy-framework--2

- Local Transport Plan 5 (LTP 5), Lincolnshire County Council (2022), and associated documents:
  - Lincolnshire Cycling Strategy;
  - Electric Vehicle Strategy;
  - Freight Strategy;
  - Local Bus Strategy;
  - Passenger Rail Strategy;
  - Rail Infrastructure Strategy; and
  - Walking Strategy.

12.3.2. The Lincolnshire County Council LTP 5[154] focuses on six key themes for the county's transport aspirations across the period 2022-2026 and beyond, which include:

- *"Supporting economic growth;*
- *Future ready, green transport;*
- *Promote thriving environments;*
- *Supporting safety, security and a healthy lifestyle;*
- *Promoting high aspirations; and*
- *Improve quality of life."*

12.3.3. These key themes will be considered throughout the design of the Proposed Development with a focus on contributing to the achievement of these aspirations where relevant and appropriate.

12.3.4. One of the objectives of the Proposed Development is to manage the traffic associated with the construction (and the future decommissioning) to limit the impacts on the surrounding highway network. Maintaining a reliable route for freight throughout the construction (and future decommissioning) of the Proposed Development is also a key priority.

12.3.5. The DCO Application will provide further information on the relevant planning policies and how they have informed the design of the Proposed Development.

Applicable guidance

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

- Environmental Assessment of Traffic and Movement, IEMA (2023)[155]; and

[154] Lincolnshire County Council. 2022. Local Transport Plan 5. Available from: https://www.lincolnshire.gov.uk/downloads/file/7200/local-transport-plan-5
[155]Institute of Environmental Management and Assessment (IEMA). 2023. Environmental Assessment of Traffic and Movement. Available from: https://www.iema.net/resources/blog/2023/07/12/new-iema-guidance-environmental-assessment-of-traffic-and-movement

- Overarching Principles on Travel Plans, Transport Assessments and Statements, Department for Levelling Up, Housing and Communities (DLUHC) (2014)[156].

12.4. Methodology

Data sources to inform baseline characterisation

12.4.1. The following data sources have been used to inform this preliminary assessment:

- Local aerial and street-level imagery and Ordnance Survey mapping;
- Road accident and safety statistics, Department for Transport (DfT) (2017-2021); and
- Traffic volumes: Manual count points, Department for Transport (DfT) (2021).

Surveys to inform baseline characterisation

12.4.2. The following surveys have been undertaken during June 2023, this being a key time period outside of school holidays but reflecting moderate agricultural activities which are predominant in this area. The locations were discussed and agreed with Lincolnshire County Council:

- Automatic Traffic Counts (ATCs) – 6 ATC counters were located throughout the study area to capture link flows on the A15, B1191 and B1188; and
- Manual Classified Count (MCC) – located at the A15/B1191 priority junction to capture the turning movements at this location.

12.4.3. A site visit was undertaken on 15th June 2023 where a site walkover was conducted to review:

- The potential traffic access routes to the Site for construction and worker traffic. These routes were inspected, and the suitability of these routes was considered;
- Appraisal of the proposed site access locations and associated construction compounds for vehicle speeds and visibility;
- The existing public rights of way (PRoW) located within the site boundary; and

[156]Department for Levelling Up, Housing and Communities (DLUHC). 2014. Overarching Principles on Travel Plans, Transport Assessments and Statements. Available from: https://www.gov.uk/guidance/travel-plans-transport-assessments-and-statements

- Local areas of sensitivity and receptors within the study area.

Design assumptions

12.4.4. **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;
- **Figure 2.6** – Indicative Operational Access & Movement Parameters Plan; and
- **Figure 2.9** – Indicative Construction Access Parameter Plan.

12.4.5. **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.

12.4.6. The design principles and parameters that have been applied in relation to traffic and transport are detailed below.

12.4.7. As outlined in **Chapter 2**, the Proposed Development is predicted to require c.40 HGV deliveries per day at peak construction stage across all temporary compounds. Theoretically, this maximum value could occur at any single temporary compound at any given time, taking into account that construction, will be phased across different areas.

12.4.8. In the absence of a detailed phasing strategy and defined origins of materials, it has been assumed for the purposes of this preliminary assessment that c.40 HGV arrivals and c.40 HGV departures could occur on any road link considered for construction traffic. Realistically, this would be spread across a small number of compounds at any specific period of construction and may be dispersed across the road network. This is a reasonable worst case scenario which has been assessed in accordance with the methodology.

12.4.9. The Proposed Development is predicted to require c.600 construction workers per day at peak construction stage across all temporary compounds. For the purposes of this preliminary assessment, it has been assumed, that at any given compound and time, it is anticipated that c.400 workers will be required. This preliminary assessment has assumed a conservative estimate of

1.5 workers per vehicle, acknowledging that the majority of workers will travel as a team on a daily basis as illustrated in **Table 12.4**.

Table 12.4 Estimated Construction Phase traffic data (2-way)

Link	2026 Construction Traffic associated with the Proposed Development	
	All Vehicles	HGVs
A15 (north of B1191)	640	80
A15 (south of B1191)	640	80
B1191 (between RAF Digby and Ashby de la Launde)	880	80
B1191 (between Scopwick and RAF Digby)	880	80
B1188 (north of Scopwick)	640	80
B1188 (south of Digby)	640	80
A15 (south of Metheringham Heath Lane)	640	80
A15 (north of Leadingham)	640	80
B1188 (south of Scopwick)	640	80
A153 (directly north of junction with A17)	640	80
A17 (between A15 and A153)	640	80

12.4.10. Construction workers may travel from a wide area and are likely to arrive along different routes from nearby towns and cities, dispersing the traffic impact. In the absence of a detailed assessment of workforce locations at this stage, this preliminary has assumed that up to 70% of workers could arrive on any given route towards the Proposed Development, offering a higher than expected volume on all road links, resulting in a reasonable worst case assessment. However, once routes have merged, closer to the Site, a combined flow of 100% of workers could be travelling along these road links.

12.4.11. Abnormal Indivisible Loads (AILs) are most likely to arrive at Immingham Port based on other similar loads in the region. However, other port options are available. The Strategic Road Network (SRN) and defined Heavy Load Routes will be used where possible to reach the Proposed Development. The impact of these deliveries are limited and are different to daily traffic movements as such loads are under strict vehicle escort and management. This can include rolling road closures and night time movement, potentially as a single delivery, thereby minimising impacts to all users. On the basis that these loads are very small in number and very short duration, AILs are not assessed in this preliminary

assessment, but will be documented within and secured by the Outline Construction Traffic Management Plan, to be prepared and submitted in support of the DCO application.

Embedded mitigation measures

12.4.12. 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. 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**.

12.4.13. Regarding those embedded mitigation measures relevant to this preliminary traffic and transport assessment, the Proposed Development seeks to protect and enhance the existing PRoW network and strategic cycle routes and ensure the provision of new and improved multi-user routes whilst aligning with Local/Neighbourhood Plan aspirations and through comprehensive engagement with stakeholders.

12.4.14. Key routes have been identified and are being proposed in respect to improvement as part of the Proposed Development as part of measures to be delivered. This could include the alteration or improvement of existing links, though additional consultation and further assessment is required and will be undertaken as part of the ES and associated Transport Assessment. These proposed links and improvements are as detailed in **Figure 2.6** and comprise the following:

- Link between RAF Digby and Scopwick;
- Walking loop for Heath Farm (an autism care centre) (including part of the RAF Digby to Scopwick route);
- A new path along western edge of the Proposed Development (linking New England Lane to join Brauncewell) as proposed by the Ramblers Society;
- Improvements to a route between Scopwick, Blankney and Metheringham as identified within the Neighbourhood Plan;
- Improvements to the Bloxholm Woods access on Heath Road.

Assessment methodology

12.4.15. 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 using refined traffic assumptions and construction methods.

12.4.16. As noted above in **Section 12.1**, due to the extent of baseline information currently known and the maturity of the design of the Proposed Development, this preliminary assessment only considers severance impacts during construction and decommissioning. Assessment of pedestrian delay; amenity; fear and intimidation; driver delay and highway safety will be reported within the ES once further baseline information has been obtained and the design of the Proposed Development has progressed.

12.4.17. The assessment of traffic and transport impacts has used a quantitative approach, in accordance with IEMA 2023 guidance, based on high level assumptions of construction parameters. For the majority of environmental aspects, this relies on percentage increases in daily traffic movements along road links, which determines the significance of effects.

12.4.18. The assessment also considers vehicle delay at junctions, which focuses on peak hours. Within this preliminary assessment, a high level analysis of vehicle delay has been undertaken to identify the likelihood of mitigation or the need for refinement of parameters, construction methods and/or phasing.

12.4.19. The IEMA 2023 guidance recommends the application of two broad rules of thumb as criteria to assist in delimiting the scale and extent of the environmental assessment:

Rule 1

- Include highway links where traffic flows will increase by more than 30% (or the number of heavy goods vehicles will increase by more than 30%).

Rule 2

- Include highway links of high sensitivity where traffic flows have increased by 10% or more.

12.4.20. These criteria should not necessarily apply to assessments of road safety and driver delay, though both of these aspects will be assessed in further detail within the Transport Assessment, with results reported in the ES as part of a dedicated study area for these assessments.

12.4.21. The assessment of impacts calculates the predicted changes in daily traffic volumes and changes during peak hours, extending across the study area(s). The traffic surveys have been assigned to different links and junctions, where applicable, and appropriate growth factors applied to generate future baseline assessments.

12.4.22. Traffic associated with the Proposed Development during the construction phase has been assigned using broad assumptions to generate a maximum level of impact across all road links as a reasonable worst case. This approach identifies which road links are likely to experience a significant effect and allows traffic routing proposals to be refined while considering potential areas for mitigation.

Sensitivity of receptors

12.4.23. A review has been undertaken of all construction traffic routes and each link, or section of link, has been given an overall level of sensitivity based on the character and the presence of certain receptors along the link.

12.4.24. For example, where a construction traffic route does not, or has, very minimal features including, but not limited to, residential dwellings, footpaths, cycle paths or other features of the built environment likely to be used and consequently presenting an impact on users of these routes, then it is determined as having a low sensitivity, unless the local highway authority has advised of noteworthy cycling and pedestrian activity on routes with none/limited such features.

12.4.25. To categorise sensitivity of a highway link proposed to be utilised for construction, **Table 12.5** below illustrates the rationale of assigning link sensitivity by 'affected parties', where affected parties are potentially considered to be 'sensitive receptors'. These criteria are taken from the IEMA 2023 guidance.

Table 12.5 Sensitivity criteria

Affected Party (Sensitive Receptor)	Built Environment Indicator on Link	Link Sensitivity
People at home	Residential properties	**Negligible:** No properties with direct frontage **Low:** Few properties with direct highway frontage on construction traffic routes. **Medium:** A number of properties with direct highway frontage on construction traffic routes **High:** A large number of properties with direct frontage
People at work	Employment uses (Offices, Industrial	**Negligible/Low:** Not adversely impacted when at work

Affected Party (Sensitive Receptor)	Built Environment Indicator on Link	Link Sensitivity
	Units etc)	
Sensitive groups (Disabled, elderly, children)	Disabled parking bays, retirement/care centres, playgrounds/centres and schools	**Negligible:** No indication of sensitive groups present **Low:** c.1 indicator of sensitive groups present, with direct highway frontage **Medium:** Low number of sensitive groups present, with direct highway frontage **High:** Multiple indicators of sensitive groups present, with direct highway frontage
Sensitive Locations	Hospitals, schools, historic buildings, places of worship	**Negligible:** No indication of sensitive groups present **Low:** c.1 indicator of sensitive groups present, with direct highway frontage **Medium:** Low number of sensitive groups present, with direct highway frontage **High:** Multiple indicators of sensitive groups present, with direct highway frontage
Users walking	Crossing points, PRoWs, Footways	**Negligible:** No indication of sensitive groups present **Low:** c.1 indicator of sensitive groups present **Medium:** Medium use by receptor group – footways present **High:** High receptor use with no footways
Users cycling/scooting	On/off-road routes, designated routes or infrastructure	**Negligible:** No indication of sensitive groups present **Low:** c.1 indicator of sensitive groups present e.g. off-road cycle

Affected Party (Sensitive Receptor)	Built Environment Indicator on Link	Link Sensitivity
		route **Medium:** On-road cycle route present with segregation **High:** On-road cycle route present with no segregation
Recreational areas/Open spaces	Parks, playgrounds/areas, shopping and community centres	**Negligible:** No indication of sensitive groups present (unlikely usage) **Low:** c.1 indicator of sensitive groups present **Medium:** Low number of sensitive groups present **High:** Multiple indicators of sensitive groups present e.g. children present
Road users	Road links/junctions, baseline traffic volume, existing signage/infrastructure	Presence of affected parties outlined in this table determine the sensitivity

12.4.26. Based on the criteria outlined in **Table 12.5**, each of the highway links allocated as construction routes for the Proposed Development have been assigned an overall link sensitivity (refer to **Table 12.9**).

Magnitude of impact/change

12.4.27. **Table 12.6** below presents the criteria that have been used to determine the magnitude of severance impacts, in accordance with IEMA (2023).

Table 12.6 Magnitude of severance impact criteria

Impact	Negligible	Minor	Moderate	Major
Severance	Increase in total traffic flows of less than 30% or under (or increase in	Increase in total traffic flows of 30-60% (or increase in HGV flows of	Increase in total traffic flows of 60-90% (or increase in HGV flows between 40%-90%)	Increase in total traffic flows of 90% and above (or increase in

Impact	Negligible	Minor	Moderate	Major
	HGV flows under 10%)	between 10%-40%)		HGV flows over 90%)

As outlined in the IEMA 2023 guidance, the assessment of severance should *"pay full regard to specific local conditions, e.g. sensitivity of adjacent land uses, prevalence of vulnerable people, whether or not crossing facilities are provided, traffic signal settings, etc."* which will be considered within the detailed assessments of effects associated with the Proposed Development.

Significance of effect

12.4.28. Following assignment of sensitivity and magnitude of impact/change, severance effects are considered to be significant or not significant according to the matrix in **Table 12.7** below. The shaded boxes indicate significant effects.

Table 12.7 Significance of severance effects

Sensitivity of Receptors	Magnitude of Impact/Change			
	Negligible	Minor	Moderate	Major
High	Negligible / Slight	Slight / Moderate	Moderate / Large	Large / Very Large
Medium	Negligible / Slight	Slight	Moderate	Moderate / Large
Low	Negligible	Negligible / Slight	Slight	Slight / Moderate
Negligible	Neutral	Negligible / Minor	Negligible / Slight	Slight

12.5. Summary of baseline conditions

Local highway network

12.5.1. The highway network surrounding the Proposed Development site, encompassing the proposed study area, is presented in **Figure 12.1** of **Volume 2**. This figure illustrates the Site in relation to the surrounding highway network.

12.5.2. The local roads within the study area will be used for direct access to the Site and will be considered, as well as the strategic routes (A1/M180) which will be used to link these local roads to the wider network but the latter will not be assessed.

A1

12.5.3. The A1 is an SRN link approximately 28km from the proposed study area. It is anticipated that traffic routeing from Immingham may utilise this link.

M180

12.5.4. Linking via the A180, the M180 enables access to the A1 via Immingham and is also part of the SRN.

A15

12.5.5. The A15 is a principal road which forms part of the primary road network, running in a north to south direction, bisecting Springwell West.

12.5.6. The A15 runs north to connect with Lincoln approximately 17.0km north of Springwell West. To the south, the A15 connects with Sleaford and the A17 approximately 9.0km to the south.

12.5.7. The A15 is a two-way single carriageway road subject to the national speed limit which provides access to a number of settlements and local roads across Lincolnshire. This road will provide a key route to and from the Site for construction traffic.

B1191 (Heath Road)

12.5.8. The B1191 is a two-way single carriageway road which splits the western and central portions of the Proposed Development in a south-west to north-east direction. The B1191 runs for approximately 6.7km, connecting the A15 to the B1188 and Scopwick village, passing the village of Ashby de la Launde and the RAF Digby air force base.

12.5.9. The south-western portion of the B1191 is subject to the national speed limit and the road is lined with hedgerows and grass verges with agricultural land beyond. There are a handful of properties/agricultural buildings set back from the carriageway in this area before the B1191 reaches Ashby de la Launde.

12.5.10. At Ashby de la Launde there are a number of residential properties in close proximity to the B1191; however, these properties are not accessed off the B1191, but instead off Main Street which connects to the B1191 at a priority junction.

12.5.11. The national speed limit continues on the B1191 as it passes Ashby de la Launde and continues north-east where the road continues to pass agricultural land and a couple of agricultural buildings, including Glebe Farm until the B1191 reaches RAF Digby.

12.5.12. As the B1191 approaches RAF Digby, the speed limit reduces to

30 mph for approximately 800m whilst the road travels alongside the air force base, a number of residential dwellings and Heath Farm, an autism care centre, which are all accessed directly from the B1191.

12.5.13. Through RAF Digby there are footways on both sides of the B1191 as well as street lighting and a zebra crossing and bus stops in place outside the air force base frontage. The crossing and footway provision can be viewed in **Plate 12.1** below.

Plate 12.1 B1191 RAF Digby (view to south)

12.5.14. Where the B1191 departs RAF Digby to the north-east, the speed limit returns to the national speed limit as the road continues to pass agricultural land with occasional agricultural buildings and some residential buildings, including Scopwick Mill until the B1191 approaches Scopwick.

12.5.15. As the B1191 approaches Scopwick, the speed limit reduces to 30 mph for the remainder of its length until it meets the B1188 at a priority junction.

12.5.16. Through Scopwick, the B1191 is lined with residential properties and has a footway running along the southern side of the carriageway and some areas of provision on the northern side. There is street lighting and a set of bus stops located in the vicinity of the B1188 junction, as illustrated in **Plate 12.2** below.

Plate 12.2 B1191 Scopwick (view to east)

B1188

12.5.17. The B1188 is a two-way single carriageway road which splits the central and eastern portions of the Proposed Development in a north to south direction. The B1188 runs for approximately 30.0km, running north as far as Lincoln and south as far as the A17 and Sleaford.

12.5.18. Where the B1191 meets the B1188 at a priority junction, the B1188 runs north through Scopwick passing through the settlements of Blankney and Metheringham in the vicinity of the Site. To the south of Scopwick, the B1188 runs through Digby before Dorrington then Ruskington.

12.5.19. Through Scopwick, the B1188 is subject to a 30 mph speed limit and the road is lined with residential properties and footway provision through the village, as illustrated in **Plate 12.3**.

Plate 12.3 B1188 Scopwick (view to south)

12.5.20. To the south, the B1188 continues, and the speed limit increases to 50 mph as it leaves Scopwick and passes through a large area of agricultural land before it meets Digby, approximately 3.5km south of Scopwick. There are no properties lining this section of the B1188.

12.5.21. The central portion of the Proposed Development will be located to the south of Scopwick, to the west of the B1188.

12.5.22. To the north of Scopwick, the B1188 leaves the village, where the speed limit increases to 50 mph. From here, the eastern side of the carriageway is lined with agricultural land until the road reaches Blankney. This is where the eastern portion of the Proposed Development will be located.

12.5.23. On the western side of the B1188 between Scopwick and Blankney, there are some recently converted residential properties before the road passes Longwood Quarry.

12.5.24. As the B1188 approaches Blankney, the speed limit reduces to 40 mph before the road passes a Church on the eastern side of the carriageway.

12.5.25. Where the B1188 passes through Blankney, there are residential properties and footways on both sides of the road, as illustrated in **Plate 12.4**.

Plate 12.4 B1188 Blankney (view to north)

12.5.26. As the B1188 departs Blankney to the north, the speed limit increases to 50 mph as it passes agricultural land before it reaches Metheringham.

12.5.27. At Metheringham, the speed limit reduces to 40 mph on the B1188 as it passes along the western border of this settlement with some residential properties accessed off the B1188.

12.5.28. From Metheringham, the B1188 continues north towards Lincoln passing through a number of other settlements further afield from the study area.

B1202 (Metheringham Heath Lane)

12.5.29. The B1202 is a two-way single carriageway road which runs in a west to east direction between the A15 and B1188 just north of Metheringham. The road is subject to the national speed limit and runs for approximately 5.0km.

12.5.30. Agricultural land lines both sides of the B1202 for the majority of its length with just a few sporadic properties. Approximately four residential properties are accessed off the northern side of the B1202 as well as a Biomethane Plant and what appears to be a disused quarry.

Local (Minor) Roads

Navenby Lane

12.5.31. Navenby Lane is a two-way single carriageway road subject to the national speed limit which runs in a west to east direction between

the A15 and B1191. Navenby Lane splits one area of the western portion of the Proposed Development.

12.5.32. Navenby Lane runs for approximately 2.1km and connects to the A15 at a priority junction to the west and to the B1191 at Ashby de la Launde village at a priority junction to the east.

12.5.33. The road is approximately 5.5m wide and both sides of the carriageway are lined with grass verges and agricultural land, with no properties along its length.

Bloxholm Lane

12.5.34. Bloxholm Lane is a two-way single carriageway road which runs in a north-west to south-east direction between the B1202 and the B1188. Bloxholm Lane runs for approximately 4.2km from the B1202 to the south-east connecting to the B1188 at a priority junction just north of Scopwick.

12.5.35. Bloxholm Lane is subject to the national speed limit and is lined by agricultural land on both sides of the carriageway for most of its length.

12.5.36. As Bloxholm Lane travels south-east from the B1202, it passes approximately three residential properties which are accessed directly from Bloxholm Lane. To the south-east, the road is lined by Longwood Quarry on the northern side of the carriageway as Bloxholm Lane approaches the B1188.

Gorse Hill Lane

12.5.37. Gorse Hill Lane is an unsurfaced rural road which runs in an east to west direction from the A15 to Pottergate Road at the northern extent of Springwell West. Gorse Hill Lane runs for approximately 3.7km, meeting the A15 and Pottergate Road at priority junctions.

12.5.38. Gorse Hill Lane is subject to the national speed limit and is lined by agricultural land, with trees and hedgerows on both sides of the carriageway with a couple of agricultural properties along its length.

Temple Road

12.5.39. Temple Road is a two-way single carriageway road which runs in an east to west direction from the A15 to Pottergate Road at the south of Springwell West. Temple Road runs for approximately 6.0km, meeting the A15 and Pottergate Road at priority junctions.

12.5.40. Temple Road is subject to the national speed limit and is lined by agricultural land on both sides of the carriageway with a couple of agricultural properties set back from the carriageway along its length.

Summary of baseline data

12.5.41. The following highway links form the network study area for this preliminary assessment. Baseline 24-hour annual average daily traffic (AADT) two-way link flows have been collated using 2021 Department for Transport (DfT) and 2023 survey data sources, applying TEMPro growth factors where required and to derive the baseline flows as illustrated below in **Table 12.8**. These factors are industry standard utilising the National Trip End Model (NTEM) datasets required as part of the process forecasting the impact of transport projects as described in the Department for Transport's TAG 'Unit M.4 Forecasting and Uncertainty'.

Table 12.8 Baseline traffic data

	Base Scenario DfT AADT Data			
Link	**Count ID**	**Year**	**All Vehs**	**HGVs**
A15 (north of B1191)	ATC Data (2023)		13967	1396
A15 (south of B1191)			15538	1510
B1191 (between RAF Digby and Ashby de la Launde)			2761	424
B1191 (between Scopwick and RAF Digby)			2042	332
B1188 (north of Scopwick)			5732	867
B1188 (south of Digby)			4923	912
A15 (south of Metheringham Heath Lane)	16208	2021	9599	692
A15 (north of Leadingham)	36224	2021	11292	847
B1188 (south of Scopwick)	806250	2021	4019	195

Accident analysis

12.5.42. A review of accident data covering the most recent five-year period available has been undertaken using data available from the Road, Accidents and Safety Statistics[157] (DfT). This covers the years

[157] Department for Transport (2023. Road, Accidents and Safety Statistics. Available online: Road accidents and safety statistics - GOV.UK (www.gov.uk)

2017-2021 and provides a map-based depiction of the available data including the date, the number of vehicles involved, the number of casualties and the severity of any resulting injuries.

12.5.43. A high-level review of the study area has been conducted to identify any potential accident hotspots across any of the highway links within this area. **Figure 12.2** of **Volume 2** presents the accidents that have been recorded within the study area with slight accidents highlighted in yellow, serious accidents in red and fatal accidents in black.

12.5.44. Over the five-year period throughout the study area, as part of the detailed assessments to be presented in the ES, key junctions and/or clusters will be reviewed in detail, seeking to further interrogate any patterns or trends that may identify any insufficiencies in the road network infrastructure relevant to the Proposed Development.

12.5.45. The junctions/links to be considered include the following locations:

- A15 between B1202 to Metheringham;
- A15 at B1191 Bloxholm Woods;
- B1191 to Scopwick-Blankney-Metheringham; and
- B1188 at Scopwick junction.

Public rights of way (PRoWs)

12.5.46. Within and intersecting the Preferred Order Limits of the Proposed Development are a series of links and routes utilised by Non-motorised Users (NMUs) comprising; pedestrians (on foot travel), cyclists, wheel-based travel (wheelchairs/mobility scooters/scooters etc) and equestrians.

12.5.47. Following the completion of PRoW surveys, an assessment of pedestrian amenity will be undertaken on affected routes and documented in the ES, taking into account any diversions that may increase journey times.

Cycle routes

12.5.48. Locally, there are no National Cycle Routes (NCN) within reasonable vicinity of the Proposed Development and as such, no link to existing NCNs is proposed. It should be noted that route improvement benefit for cyclists could be the Scopwick-Blakney-Metheringham route identified within the Neighbourhood Plan.

Public transport

12.5.49. Local public transport services comprise bus services only:

- 18M – Metheringham Callconnect
- 31 and 31X – Lincoln Central Bus Station – Sleaford Rail Station
- M1 – Anwick Moy Park Factory – North Hykeham Health Centre
- M2 – Anwick Moy Park Factory – Tower Estate Crofton Road
- 55 and B5 and B5X – Coningsby – Lincoln
- 18S – Sleaford Callconnect.

Sensitive receptors

12.5.50. The sensitive receptors identified across the study area are presented in **Table 12.9** and their extent and location is illustrated in **Figure 12.3**.

Table 12.9 Sensitive receptors

Link	Section	Sensitive receptors
A15	Full length of route within study area	Properties set back from the carriageway and PRoW road crossings. **Low sensitivity**
B1191	A15 – Ashby de la Launde	Sporadic agricultural properties, not located close to the carriageway. **Low sensitivity**
	Ashby de la Launde – RAF Digby	Residential settlements (Ashby de la Launde and RAF Digby); operational Air Force base; and, Heath Farm (an autism care centre). All located close to the carriageway. **High sensitivity**
	RAF Digby – Scopwick	Sporadic residential and agricultural properties close to the carriageway. **Low sensitivity**
	Scopwick – B1188	Residential settlement (Scopwick) located close to the carriageway. **High sensitivity**
B1188	Scopwick	Residential settlement (Scopwick) located close to the carriageway. **High sensitivity**

Link	Section	Sensitive receptors
	Scopwick – Blankney	No properties identified close to the carriageway. **Low sensitivity**
	Blankney	Residential settlement (Blankney) and a Church located close to the carriageway. **High sensitivity**
	Blankney – Metheringham	Sporadic residential properties set back from the carriageway. **Low sensitivity**
	Metheringham	Residential settlement (Metheringham) located close to the eastern side of the carriageway. Cluster of 'slight' accidents recorded at the B1202/B1188 junction. **Medium sensitivity**
	Scopwick – Digby	Sporadic agricultural properties, not located close to the carriageway. **Low sensitivity**
	Digby	Residential settlement (Digby) located close to the carriageway. **High sensitivity**
B1202	Full length of route within study area	Sporadic residential properties located close to the carriageway and some agricultural properties set back from the carriageway. Cluster of 'slight' accidents recorded at the B1202/B1188 junction. **Medium sensitivity**
Navenby Lane	Full length of route	No sensitive receptors identified on this link. **Low sensitivity**
Bloxholm Lane	Full length of route	Small cluster of residential properties located close to the carriageway. **Low sensitivity**
Gorse Hill Lane	Full length of route	Sporadic agricultural properties located close to the carriageway.

Link	Section	Sensitive receptors
		Low sensitivity
Temple Road	Full length of route	Sporadic agricultural properties set back from the carriageway.
		Low sensitivity

Future baseline

12.5.51. The future baseline conditions relating to transport will generally be affected by a number of factors. This can include traffic generated by new development, changes in transport trends and availability of infrastructure.

12.5.52. There are currently no known significant future developments that already have planning consent, which are likely to have a material impact on the operation of the road network within the study area. Other existing developments in the area have been considered as part of the preliminary cumulative assessment reported in **Chapter 15: Cumulative Effects**, with full details to be included and assessed where necessary, in the ES. Notwithstanding, changes in traffic flows associated with general growth in development across the region are applicable, particularly as these will also take into account changes in transport trends, such as increased car ownership.

12.5.53. It is currently anticipated that subject to consents and approvals, construction of the Proposed Development would commence in 2026. Traffic growth factors are calculated based on changes within a specific zone and are derived using the Department for Transport's TEMPro national program (Trip End Model Presentation Program). Such factors have been derived to factor traffic flows from a survey year of 2023 (survey data) to a construction year of 2026. This represents a reasonable worst-case year of assessment as traffic growth increases year on year and any percentage impacts would therefore reduce beyond 2026. The impacts have been assessed on the basis of peak construction traffic during this year, although construction traffic volumes will vary across the anticipated four year construction period.

12.5.54. The TEMPro factors applied are illustrated in **Table 12.10** by future year and road classification:

Table 12.10 TEMPro Factors

2023-2026	
Principal	
Daily	1.02415

12.5.55. Future year baseline traffic flows for the 2026 assessment scenario are presented in **Table 12-11**.

Table 12.11 Future year baseline flows

Link	2026 Construction Year	
	All Vehs	HGVs
A15 (north of B1191)	14,304	1,430
A15 (south of B1191)	15,913	1,546
B1191 (between RAF Digby and Ashby de la Launde)	2,828	434
B1191 (between Scopwick and RAF Digby)	2,091	340
B1188 (north of Scopwick)	5,870	888
B1188 (south of Digby)	5,042	934

12.5.56. For NMUs, significant alterations to the pedestrian, cycle and PRoW networks within the timeframe of construction of the Proposed Development are not anticipated, though some isolated alterations may be required to enable construction.

12.5.57. Public transport networks are often subject to changes, particularly in rural areas. Bus services are susceptible to reductions in service due to the way they are funded and there is the potential for available services to be less frequent and/or less connected in 2026 than they are currently without maintaining or increasing funding.

12.6. Likely effects, additional mitigation and residual effects

12.6.1. As noted above in **Section 12.1**, due to the extent of baseline information currently known and the maturity of the design of the Proposed Development, this preliminary assessment only considers severance impacts during construction and decommissioning. Assessment of pedestrian delay; amenity; fear and intimidation; driver delay and highway safety will be reported within the ES once further baseline information has been obtained and the design of the Proposed Development has progressed.

12.6.2. Access to the construction compounds for construction workers associated with the Proposed Development is likely to be made from the B1202; B1188; A1191 and the A15, as displayed in **Figure 2.6**.

12.6.3. Additional mitigation measures to manage the movement of construction traffic will be documented within and secured by the Outline Construction Traffic Management Plan, which will minimise those likely impacts identified in **Table 12.12** below. The Outline Construction Traffic Management Plan will likely include the following details:

- Access and parking arrangements for site personnel, contractors and visitor arrangements for delivery and removal of materials;
- Arrangements for loading, unloading and storage of plant and materials;
- A scheme for routing and control of traffic associated with the construction and temporary signage during the construction phase;
- Implementation programme including the proposed construction period and hours of operation; and
- Details of any additional management measures, including details of wheel washing facilities and condition surveys.

12.6.4. An Outline Travel Plan will be prepared as part of the Outline Construction Traffic Management Plan. The Outline Travel Plan will set out strategies to encourage the use of sustainable transport for the construction workforce. This will include details on initiatives to increase car sharing, while other measures will be explored for the preparation of the ES such as shuttle services to/from temporary compounds and provision of staff parking facilities, as well as other measures to encourage mode shift away from private car use.

12.6.5. The final details of both the Outline Travel Plan and Outline Construction Traffic Management Plan will be agreed with the local planning authorities, prior to the commencement of the construction phase.

Construction phase

Table 12.12 Qualitative assessment of likely effects, additional mitigation and residual effects during construction effects and monitoring during construction

Receptor/Matter	Likely Effects/Additional Mitigation/Residual Effects (Secondary and Tertiary)	
A15	Likely effects	The A15 is part of the primary road network with a high volume of traffic and high speed with very limited frontage or users alongside. However, PRoWs cross the A15 and therefore the likely effects will be on

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
		severance, while road safety will be affected by additional turning traffic.
	Additional (secondary and tertiary) mitigation	The routing of construction traffic, including avoidance of accident hotspots, will be documented within and secured by the Outline Construction Traffic Management Plan, while improvements to PRoW crossing points will be considered.
	Likely residual effects	The sensitivity of the A15 link is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**.
B1191 (A15 to Scopwick)	Likely effects	This section of the B1191 is expected to carry the largest volume of construction traffic aside from the A15 as it serves a number of temporary compounds along the primary construction route. The predicted increase in traffic volumes exceeds 30%, which could have potential effects on driver delay, road safety, severance and NMUs.
	Additional (secondary and tertiary) mitigation	Subject to the outcome of further assessments, potential mitigation could include junction and crossing improvements and PRoW protection or temporary closure/diversions. Traffic access routes and any restrictions on timings will be documented within and secured by the Outline Construction Traffic Management Plan.
	Likely residual effects	The sensitivity of the B1191 link is categorised as both **low** and **high** across the link. The likely significance of the severance effect has been categorised per link section: <u>A15 – Ashby de la Launde:</u> The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
		negligible. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**. <u>Ashby de la Launde – RAF Digby</u> The sensitivity of the link section is **high** and the magnitude of impact/change, following additional mitigation, is predicted to be **minor**. Therefore, there is likely to be a **slight/moderate**, temporary adverse residual severance effect, which is predicted to be **not significant**. <u>RAF Digby – Scopwick</u> The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**. <u>Scopwick – B1188</u> The sensitivity of the link section is **high** and the magnitude of impact/change, following additional mitigation, is predicted to be **minor**. Therefore, there is likely to be a **slight/moderate**, temporary adverse residual severance effect, which is predicted to be **not significant**.
B1188 (Scopwick to Digby)	Likely effects	This section of the B1188 could potentially carry a moderate volume of construction traffic from the A17 to the south to serve a number of temporary compounds. The predicted increase in traffic volumes would exceed 10% on links that are categorised as sensitive due to passing through built up areas. This increase could have potential effects on driver delay, road safety, severance and NMUs.
	Additional (secondary and tertiary) mitigation	The routing of construction traffic will be documented within and secured by the Outline Construction Traffic Management Plan, including avoidance of sensitive

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
		locations by HGVs such as Ruskington and Digby.
	Likely residual effects	Scopwick The sensitivity of the link section is **high** and the magnitude of impact/change, following additional mitigation, is predicted to be **minor**. Therefore, there is likely to be a **slight/moderate**, temporary adverse residual severance effect, which is predicted to be **not significant**. Scopwick-Digby The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**. Digby The sensitivity of the link section is **high** and the magnitude of impact/change, following additional mitigation, is predicted to be **minor**. Therefore, there is likely to be a **slight/moderate**, temporary adverse residual severance effect, which is predicted to be **not significant**.
B1188 (Scopwick to Metheringham)	Likely effects	This section of the B1188 could potentially carry a moderate volume of construction traffic from the A15 to the west to serve a number of temporary compounds. The predicted increase in traffic volumes would exceed 10% on links that are categorised as sensitive due to passing through built up areas. This increase could have potential effects on driver delay, road safety, severance and NMUs.
	Additional (secondary and tertiary) mitigation	The routing of construction traffic will be documented within and secured by the Outline Construction Traffic Management Plan, including minimising use of sensitive routes by HGVs such as Metheringham.

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
	Likely residual effects	<u>Scopwick - Blankney</u> The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**. <u>Blankney</u> The sensitivity of the link section is **high** and the magnitude of impact/change, following additional mitigation, is predicted to be **minor**. Therefore, there is likely to be a **slight/moderate**, temporary adverse residual severance effect, which is predicted to be **not significant**. <u>Blankney - Metheringham</u> The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**. <u>Metheringham</u> The sensitivity of the link section is **medium** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible/slight**, temporary adverse residual severance effect, which is predicted to be **not significant**.
B1202 (A15 to Metheringham)	Likely effects	This section of the B1202 could be used for routing of construction traffic from the A15 to the west to serve a number of temporary compounds. The predicted increase in traffic volumes is unlikely to exceed 30% if it were to only serve Springwell East (**Figure 2.2**), though its junction with the A15 has a moderate level of accidents. This increase could have potential effects on driver delay and road safety.

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
	Additional (secondary and tertiary) mitigation	The routing of construction traffic will be documented within and secured by the Outline Construction Traffic Management Plan, including minimising use of sensitive routes by HGVs such as the B1202.
	Likely residual effects	The sensitivity of the link section is **medium** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible/slight**, temporary adverse residual severance effect, which is predicted to be **not significant**.
Navenby Lane	Likely effects	Navenby Lane will only be crossed by construction traffic and not be travelled by HGVs. A crossing point could therefore have a potential effect on NMUs.
	Additional (secondary and tertiary) mitigation	The routing of construction traffic will be documented within and secured by the Outline Construction Traffic Management Plan, including details and controls of road crossings by HGVs.
	Likely residual effects	The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**.
Bloxholm Lane	Likely effects	Bloxholm Lane could be used as an alternative to travelling through Metheringham to reach eastern areas of the Proposed Development by construction traffic. This increase could have potential effects on driver delay due to the narrow carriageway.
	Additional (secondary and tertiary) mitigation	The routing of construction traffic will be documented within and secured by the Outline Construction Traffic Management

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
		Plan, including minimising use of sensitive routes by HGVs.
	Likely residual effects	The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**.
Temple Road	Likely effects	Temple Road could potentially be used for routing of construction traffic from the A15 to the east to serve a temporary compound. The predicted increase in traffic volumes could exceed 30% on this link, based on the single compound it serves and the lightly trafficked nature. This increase could have potential effects on driver delay, road safety, severance and NMUs.
	Additional (secondary and tertiary) mitigation	Subject to the outcome of assessments, potential mitigation could include junction improvements and PRoW enhancements. Traffic access routes and any restrictions on timings will be documented within and secured by the Outline Construction Traffic Management Plan.
	Likely residual effects	The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**.
Gorse Hill Road	Likely effects	Gorse Hill Road could potentially carry a moderate volume of construction traffic from the A15 to the east to serve a temporary compound. The predicted increase in traffic volumes is expected to exceed 30% on this link. This increase could have potential effects on driver delay and road safety.

Receptor/Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
	Additional (secondary and tertiary) mitigation	Subject to the outcome of assessments, potential mitigation could include junction improvements, carriageway widening and resurfacing. Traffic access routes and any restrictions on timings will be documented within and secured by the Outline Construction Traffic Management Plan.
	Likely residual effects	The sensitivity of the link section is **low** and the magnitude of impact/change, following additional mitigation, is predicted to be **negligible**. Therefore, there is likely to be a **negligible**, temporary adverse residual severance effect, which is predicted to be **not significant**.

Decommissioning phase

12.6.6. For the purposes of this preliminary assessment, the decommissioning year is assumed to be 40 years post-completion. This is considered to be too far into the future to be able to accurately predict traffic flows or road/junction layouts at that time. It is therefore considered reasonable to assume that the impacts during the decommissioning phase will be the same as, or not greater than, the construction phase. This may overestimate the actual impacts slightly, but it is considered broadly accurate.

12.6.7. The management of movement of decommissioning traffic will be documented within and secured by the Outline Decommissioning Environmental Management Plan.

12.7. Opportunities for environmental enhancement

12.7.1. At the time of writing, there are limited opportunities for environmental enhancement specifically related to traffic and transport associated with the Proposed Development.

12.7.2. Some recreational enhancements to NMU movement and crossing point provision may be provided, as discussed within this chapter. All such elements will be considered and reviewed within the ES and associated Transport Assessment reports.

12.8. Intra-project combined effects

12.8.1. There is potential for the interaction and combination of different environmental residual effects from within the Proposed Development to affect identified traffic and transport receptors.

These can include impacts on PRoWs or permissive routes. Such impacts will be considered within the ES once relevant assessments are further progressed.

12.8.2. Conversely, the emissions from construction traffic are a source of effects for multiple receptors related to other environmental assessments including air quality, noise and vibration and biodiversity. These effects are, and will be, addressed within the other relevant environmental factor chapters rather than in this chapter, which focuses on traffic and transport.

12.8.3. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

12.9. Difficulties and uncertainties

12.9.1. 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.

12.9.2. In respect to access to construction compounds, the number and set locations of accesses have not yet been finalised; these will be defined and assessed within the ES and associated Transport Assessment reports. Measures to manage construction traffic will be documented within and secured by the Outline Construction Traffic Management Plan.

12.9.3. Definitive construction traffic estimations are not known but estimates have been considered within this PEIR and will be refined as necessary to inform assessments presented in the ES and Transport Assessment reports.

12.10. Further work to inform the ES

12.10.1. Discussions will be held with the relevant highway authorities to identify the need for adjustments to assumptions or parameters. This will include any restrictions on routing as a result of likely effects on specific road links. As noted in this chapter, associated analysis within the Transport Assessment will be used to inform the ES, further to the methodology outlined above. Assessment of pedestrian delay; amenity; fear and intimidation; driver delay and highway safety will be reported within the ES.

13. Water

13.1. Introduction

13.1.1. 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 water (flood risk, hydrology and drainage).

13.1.2. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR) with particular reference to **Chapter 6: Biodiversity** and **Chapter 10: Land, Soils and Groundwater**.

13.2. Consultation, scope and study area

Consultation undertaken to date

13.2.1. An EIA Scoping Report, as provided in **Appendix 4.1**, setting out the proposed water 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 water in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

13.2.2. **Table 13.1** provides a summary of the consultation activities undertaken in support of the preparation of this preliminary assessment, in addition to the EIA Scoping process.

Table 13.1 Summary of consultation undertaken

Consultee	Key Matters Raised	Actions in response to consultee comments
Environment Agency	Online meeting (23 June 2023) between the Applicant and the Environment Agency to introduce the Proposed Development and discuss the project principles and work undertaken to date.	The Applicant requested further information on ongoing local projects such as 'Project Groundwater' and 'Bringing back the Limestone Becks' project to understand if these could be aligned with the outcomes of the Proposed Development. An email response from the Environment Agency following the meeting (12th July 2023) outlined further details of 'Project Groundwater', this was described by

Consultee	Key Matters Raised	Actions in response to consultee comments
		the Environment Agency as *'a new project aimed at better understanding flood risk and is led by Lincolnshire County Council. Scopwick is listed as one of the current priorities, where the project will look to investigate, model and mitigate the causes of groundwater flooding impacting sewage infrastructure and properties in Scopwick.'* The `Bringing the Limestone Becks Back to Life' project is described by the Environment Agency as *'a successful collaboration between East Mercia Rivers Trust, the Environment Agency, and the Wild Trout Trust and aims to improve and protect Lincolnshire's limestone becks from deterioration.'* Additionally in the email response, the Environment Agency provided the following response with regards to flood risk, *'Most of the site boundary sits within flood zone 1. There are some elements of the site which have small parts of flood zone 2 and 3. The scoping report shows the essential infrastructure will sit in flood zone 1. There are no proposed river crossings or interaction with embankments or assets - if there are this is not clear in the scoping report. We would require permitting advice to be sought from us if river crossings were proposed in future.'* The requirement of river/ditch crossings is yet to be determined and if required, permitting advice will be sought.

13.2.3. Consultation and engagement with consultees and relevant stakeholders is still ongoing, and will continue to inform the design and EIA process.

Scope of the assessment

13.2.4. 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

13.2.5. **Table 13.2** 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 13.2 Receptor/matters scoped out of further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Flood risk	Construction and operation	Given the nature of the Site and the Proposed Development, and subject to ensuring no increase in flood risk and agreeing design and mitigation measures with the Environment Agency, Lincolnshire County Council (the Lead Local Flood Authority) and the Witham First Internal Drainage Board, PINS agreed to scope this matter out of the ES. However, a stand-alone Flood Risk Assessment will be submitted in support of the DCO application.	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.

Receptors/matters scoped into further assessment

13.2.6. **Table 13.3** 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.

13.2.7. It should be noted that groundwater has been considered as a sensitive receptor as part **Chapter 10: Land, Soils and Groundwater** and so has not been scoped into the water

assessment.

Table 13.3 Receptor/matters scoped into further assessment

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
Water quality	Construction and decommissioning	Within the Scoping Opinion, PINS made note that not enough evidence regarding the design and control measures had been provided within the EIA Scoping Report to scope impacts to water quality out during construction or decommissioning.	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.
Water resources	Construction and operation	Within the Scoping Opinion, PINS has requested this matter to be considered due to the area being classified as water stressed.	Change - this matter was not considered within the EIA Scoping Report, but the Scoping Opinion has requested it to be considered. Following further consideration, the Applicant agrees with this opinion for the purposes of this preliminary assessment.
Water Framework Directive (WFD)	Construction and operation	The EIA Scoping Report identified the potential for contamination of surface water and groundwater bodies and given the location of the Proposed Development relative to surrounding WFD classified	Change - this matter was not considered within the EIA Scoping Report, but the Scoping Opinion has requested it be considered. Following further consideration, the

Receptor/ matter	Phase	Justification	Change to the approach proposed in the EIA Scoping Report
		waterbodies, PINS has requested (via the Scoping Opinion) that this matter be considered.	Applicant agrees with this opinion for the purposes of this preliminary assessment.

Extent of the study area

13.2.8. For the purposes of this preliminary assessment, the Site and a 1km buffer have been considered with regard to identifying hydrological feature related receptors that could be impacted by the construction, operation and/or decommissioning of the Proposed Development. In the absence of any specific guidance relating to solar developments and in accordance with Design Manual for Roads and Bridges LA 113 (2020)[158], a 1km buffer is considered appropriate for water environment assessments. A 1km buffer is a sufficient distance to enable the deposition of silts in overland flows and dilution of any concentrated pollutants so that waterbodies at a greater distance than the buffer would not be at risk of being affected.

13.3. Legislative framework, planning policy and guidance

Relevant legislation

13.3.1. The Water Framework Directive Regulations 2017 (WFD) came into effect in April 2017 and originate from the European Union (EU) Water Framework Directive (2000). The WFD continues to form part of UK law post Britian leaving the EU. All new activities in or potentially affecting the water environment need to consider the WFD. The relevant Environmental Objectives set out in the WFD are listed below:

- Prevent deterioration in the status of aquatic ecosystems, protect them and improve the ecological condition of waters;
- Aim to achieve at least good status for all water bodies by 2015. Where this is not practicable and subject to the criteria set out in the WFD, aim to achieve good status by 2021 or 2027;

[158] Design Manual for Roads and Bridges LA 113, Road drainage and the water environment, Sustainability & Environment Appraisal (March 2020). Available online: LA 113 - Road drainage and the water environment (standardsforhighways.co.uk)

- Meet the requirements of the WFD;
- Promote sustainable use of water as a natural resource;
- Conserve habitats and species that depend directly on water;
- Progressively reduce or phase out the release of individual pollutants or groups of pollutants that present a significant threat to the aquatic environment; and
- contribute to mitigating the effects of floods and droughts.

13.3.2. The Flood and Water Management Act 2010 provides more comprehensive management of flood risk for people, homes and businesses, helps safeguard community groups from unaffordable rises in surface water drainage charges, and protects water supplies to the consumer. The activities required under this Act aim to reduce the flood risk associated with extreme weather.

Relevant planning policy

13.3.3. Planning policy relevant to water comprises the following:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)[159] - Section 5.8 outlines the planning policy for flood risk, including guidance on undertaking a flood risk assessment and resilience to the effects of climate change. This section also states that a flood risk assessment needs to accompany a proposed development within flood zone 2 or 3.
- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[160] - Section 5.8 outlines the planning policy for flood risk, including guidance on undertaking a flood risk assessment and resilience to the effects of climate change. This section also states that a flood risk assessment needs to accompany a proposed development within flood zone 2 or 3.
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[161] - Section 2, though not to solar development, outlines increased risk of flooding as a result of climate change should be considered for proposals.

[159] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[160] 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
[161] National Policy Statement for Renewable Energy (EN-3) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure

- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[162] - Section 3.10 gives specific consideration to solar development including direction relating to the consideration and assessment of flood risk.
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2011)[163] - Section 2.4 gives consideration to climate change and the increased risks to resilience as a result; the section identifies that future increases in risk of flooding should be covered in any flood risk assessment.
- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023)[164] - Section 2.3 gives consideration to climate change and the increased risks to resilience as a result; the section identifies that future increases in risk of flooding should be covered in any flood risk assessment.
- National Planning Policy Framework (NPPF) (September 2023)[165] sets out the criteria for development and flood risk by stating that inappropriate development in areas at risk of flooding should be avoided by directing development away from areas at highest risk, but where development is necessary, making it safe without increasing flood risk elsewhere.
- Planning Practice Guidance - Flood Risk and Coastal Change[166], Communities and Local Government (2022) - Provides additional guidance to ensure the effective implementation of the planning policy set out in the NPPF on development in areas of flood risk.

[162] 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

[163] National Policy Statement for Renewable Energy (EN-5) (2011). Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/47858/1942-national-policy-statement-electricity-networks.pdf

[164] Draft National Policy Statement for Renewable Energy (EN-5) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements

[165] Department for Levelling Up, Housing and Communities, 'National Planning Policy Framework', published 27 March 2012, updated 5 September 2023. Available online: National Planning Policy Framework - GOV.UK (www.gov.uk)

[166] Planning Practice Guidance - Flood Risk and Coastal Change, Communities and Local Government, published March 2014 and last updated August 2022.

- Joint Lincolnshire Flood Risk and Water Management Strategy 2019-2050[167] - The strategy outlines aims for effective management of water and flood risk. Promoting a greater mix of measures including water retention and attenuation and natural flood risk management methods is identified as a way of covering water management with flood risk.

Applicable guidance

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

- The Construction Industry Research and Information Association (CIRIA), The Sustainable Drainage System (SuDS) Manual (2015)[168]
- CIRIA, Environmental Good Practice on Site (C741) (2015)[169]
- The State of Environmental Impact Assessment Practice in the UK, Institute of Environmental Management and Assessment, (IEMA) (2011)[170].

13.4. Methodology

Data sources to inform baseline characterisation

13.4.1. An initial desk-based hydrology study has been undertaken as part of the assessment which has included a review of existing watercourses, water quality, drainage and areas prone to fluvial flooding as identified on the flood map for planning[171].The watercourses and flood zones from the flood map for planning are shown in **Figure 2.1**.

13.4.2. Initial baseline information on the physical environment has been collected from the following sources:

[167] Joint Lincolnshire Flood Risk and Water Management Strategy 2019 – 2050. Available online: Lincolnshire Joint Flood Risk and Drainage Management Strategy - Implementing the Strategy in Partnership

[168] The Construction Industry Research and Information Association (CIRIA), The Sustainable Drainage System (SuDS) Manual (2015). Available online: Update to the SuDS Manual - GOV.UK (www.gov.uk)

[169] The Construction Industry Research and Information Association (CIRIA), Environmental Good Practice on Site (C741) (2015). Available online: Environmental good practice on site (ciria.org)

[170] Institute of Environmental Management and Assessment, "The State of Environmental Impact Assessment Practice in the UK," IEMA, 2011.

[171] Environment Agency. Flood Map for Planning. Available online: Flood map for planning - GOV.UK (flood-map-for-planning.service.gov.uk)

- Defra MAGIC Map[172];
- Environment Agency and the relevant local authorities, on abstractions and discharges to watercourses and water quality records;
- Hydrogeological maps;
- Groundwater vulnerability maps;
- Soil survey maps including The British Geological Survey (BGS) Geology Map[173];
- Internal Drainage Boards Map[174]; and
- Local Authority private water supply records.

Surveys to inform baseline characterisation

13.4.3. No surveys or site visits have been undertaken to inform this preliminary assessment.

Design assumptions

13.4.4. **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.

13.4.5. **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 preliminary assessment.

Embedded mitigation measures

13.4.6. This preliminary assessment has been based on the principle that measures have been 'embedded' into the design of the Proposed

[172] Department for Environment, Food & Rural Affairs. MAGIC Map (2023). Available online: MAGIC (defra.gov.uk)
[173] The British Geological Survey (BGS) Geology Viewer. Available online: BGS Geology Viewer - British Geological Survey
[174] Witham Internal Drainage Board Map (2023). Available online: Maps – Witham & Humber Drainage Boards (witham3idb.gov.uk)

Development to remove potential significant effects as far as practicable, for example by the considered placement of infrastructure. 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**.

13.4.7. Those embedded mitigation measures relevant to this preliminary water assessment comprise:

- Offsets of at least 10m will be provided either side from main rivers and 6m from ditches.
- Boundary fencing will not be constructed through existing hedgerows or across ditches.
- The Solar PV modules will be separated by a rainwater gap to allow rainwater to drain freely to the ground between the panels helping to replicate greenfield runoff conditions.
- A detailed operational drainage design will be carried out pre-construction to account for the areas of hardstanding at the Springwell Substation and Battery Energy Storage System (BESS) compound.
- To ensure potentially contaminated runoff does not enter the wider hydrological network, a system would be installed to isolate and contain any firewater runoff in the event of an emergency. The potentially contaminated runoff would then be contained within an underground attenuation tank prior to being collected and tankered offsite to be suitably tested and disposed of.

Assessment methodology

13.4.8. 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.

13.4.9. A desk-based study has been undertaken to identify the existing hydrological features and assess any potential effects caused by the Proposed Development during the construction, operation and decommissioning phases. The hydrology has been assessed in terms of the natural drainage patterns and water quality.

13.4.10. In order to inform this preliminary assessment, additional information has been obtained from Environment Agency sources, such as fluvial flood mapping and information on nationalised modelling of surface water flow paths available from online

government meta data[175].

13.4.11. Where necessary, additional mitigation has been identified following best practice guidelines including the (now revoked) Environment Agency Pollution Prevention Guidelines (PPGs). PPGs contained a mix of regulatory requirements and good practice advice; however, the Environment Agency does not provide 'good practice' guidance and withdrew the PPGs from use[176].

13.4.12. Online guidance provided by the Environment Agency for water abstraction and impound licensing applications has been used for the assessment of water resources[177] magnitude of impact criteria. The guidance notes that water abstraction that is less than 20 cubic metres of water a day does not require a license. Therefore, water usage that is less than 20 cubic metres of water a day is not considered significant and would be a negligible magnitude of impact.

13.4.13. The preliminary assessment of likely significant effects has taken into account the sensitivity of the receptor and the magnitude of the impact on that receptor. Criteria for determining the sensitivity of the receptor, based on professional judgement, are presented in **Table 13.4** below.

Table 13.4 Receptor sensitivity criteria

Sensitivity	Criteria Guide
High	The receptor has low ability to absorb change without fundamentally altering its present character, is of high environmental value, or of national importance. In terms of hydrological receptors, this relates to; • A watercourse of National importance; • Areas of Flood Zone 3 or at high risk of surface water [or other forms of] flood risk; • WFD recorded watercourse achieving 'Good' or targeted as 'Good' status (including immediately downstream watercourses); • Regional sewer or water supply networks;

[175] 'Risk of Flooding from Surface Water Speed: 1 percent annual chance', Environment Agency, accessed 19th September 2023. Available at: https://www.data.gov.uk/dataset/592d6b5f-8ca3-4713-bf04-b6d77422d7e2/risk-of-flooding-from-surface-water-speed-1-percent-annual-chance

[176] Pollution prevention guidance (PPG), Environment Agency, 2 July 2014, accessed 02 October 2023, available online: https://www.gov.uk/government/collections/pollution-prevention-guidance-ppg

[177] Apply for a water abstraction or impounding licence, published 8 May 2014, last updated 1 June 2023, Environment Agency, accessed 19 September 20233, available online: https://www.gov.uk/guidance/water-management-apply-for-a-water-abstraction-or-impoundment-licence

Sensitivity	Criteria Guide
	• A flood plain or defence protecting between 1 and 100 residential properties or industrial premises from flooding; • Protected or designated areas, e.g., Sites of Special Scientific Interest (SSSI), Ramsar sites, Special Protected Areas (SPAs), Special Areas of Conservation (SACs), which are highly sensitive to disruption; • Supports industrial or agricultural abstraction of >500 m3/day or supports a public potable water supply to a large community.
Medium	The receptor has moderate capacity to absorb change without significantly altering its present character, has some environmental value, or is of regional importance. In terms of hydrological receptors this relates to; • A watercourse of Countywide importance; • Areas of Flood Zone 2 or medium surface water flood risk; • WFD recorded watercourse achieving 'Moderate' or targeted as 'Moderate' status (including immediately downstream watercourses); • Local sewer or water supply networks; • Supports industrial or agricultural abstraction of 50 - 500 m^3/day or supports a Private Water Supply of potable water to a small community
Low	The receptor is tolerant of change without detriment to its character, is of low environmental value, or local importance In terms of hydrological receptors this relates to; • A watercourse of Local to District importance; • Areas of Flood Zone 1 or low surface water flood risk; • WFD recorded watercourse achieving 'Poor' or targeted as 'Poor' status (including immediately downstream watercourses); • On-site sewer or water supply networks; • Supports an abstraction for agricultural or industrial use of <50m^3/day.

13.4.14. The criteria used to assess the magnitude of impact are outlined in **Table 13.5**. The allocation of the level of magnitude is identified through the consideration, and application, of professional judgement and the assessment of the supporting evidence.

Table 13.5 Magnitude of impact criteria

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. (E.g. large increase or decrease in peak flood level, significant deterioration or improvement of water quality)
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. (E.g. moderate increase or decrease in peak flood level, moderate deterioration or improvement of water quality)
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. (E.g. slight increase or decrease in peak flood level, slight deterioration or improvement of water quality)
Negligible	Very little change from baseline conditions. Change is barely distinguishable, approximating to a 'no change' situation. (E.g. no discernible effects on hydrological elements (neither beneficial nor adverse)

13.4.15. The determination of the significance of effect is achieved using the matrix presented in **Table 13.6**.

Table 13.6 Significance of effect

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

13.4.16. The terms used within **Table 13.6** are defined as follows:

- Major adverse/beneficial effect: where the development will cause significant improvement (or deterioration) to the existing environment.
- Moderate adverse/beneficial effect: where the development will cause noticeable improvement (or deterioration) to the existing environment.
- Minor adverse/beneficial effect: where the development will cause perceptible improvement (or deterioration) to the existing environment.
- Negligible: no discernible improvement or deterioration to the existing environment.

13.4.17. For the purposes of this preliminary assessment, moderate or major beneficial/adverse effects are deemed to be significant. Minor beneficial/adverse or negligible effects are deemed to be not significant.

13.5. Summary of baseline conditions

Flooding

13.5.1. The Environment Agency flood map for planning[178] was used for the assessment of fluvial flood risk to the Site. Spatial data available online for flood zone 2[179] and flood zone 3[180] have been reviewed and outlined on the Environmental Features Plan provided in **Figure 2.1**.

13.5.2. According to the Environment Agency flood map for planning, the Site is predominantly located within flood zone 1 (land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding (<0.1%), though areas of flood zones 2[181] and flood zone 3[182] do extend into some of the fields, particularly in the north east of the Site within Springwell East and alongside the east of Springwell West, as detailed in **Figure 2.1**. Similarly, the Site is typically at a low or very low risk of surface water flooding, though

[178] Environment Agency, Flood Map for Planning (2023). Available online: Flood map for planning - GOV.UK (flood-map-for-planning.service.gov.uk)
[179] Environment Agency, Flood Map for Planning (Rivers and Sea) – Flood Zone 2. Available online: Flood Map for Planning (Rivers and Sea) - Flood Zone 2 - data.gov.uk
[180] Environment Agency, Flood Map for Planning (Rivers and Sea) – Flood Zone 3. Available online: Flood Map for Planning (Rivers and Sea) - Flood Zone 3 - data.gov.uk
[181] flood zone 2 - land assessed as having between a 1 in 100 and 1 in 1,000 annual probability of river flooding (1% – 0.1%), or between a 1 in 200 and 1 in 1,000 annual probability of sea flooding (0.5% – 0.1%

[182] flood zone 3 - land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%), or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%)

some fields within Springwell East do have a greater extent of areas of low to high surface water flood risk.

Waterbodies

13.5.3. The Site is shown on topographic mapping to be undulating with ground levels between approximately 30mAOD and 10mAOD across the Site. Lower site levels are typically towards the eastern boundaries of the Site. Many of the fields within the Site boundary are delineated by small field boundary drains/drainage ditches. The majority of these watercourses are unnamed. The ditches are not WFD classified and therefore considered low sensitivity receptors.

13.5.4. The Environment Agency is responsible for the maintenance, improvement or construction work on waterbodies classified as 'main rivers'. Main rivers are usually larger rivers or streams, though the Environment Agency decide on the designation of the waterbody as such. From the Environment Agency's main river mapping service[183], there are several main rivers within 2km of the Site.

13.5.5. The closest main river is Springwell Brook/Digby Beck, located outside of the Site boundary approximately 1.55km east from field reference Bcd111 (as shown on the Zonal Masterplan in **Figure 2.3**) and is shown as extending from Bloxholm in an easterly direction until it reaches Dorrington Dike (a larger Main River).

13.5.6. An upstream tributary of Dorrington Dike is classified as a main river, which is located outside of the Site boundary and is approximately 1.6km south from field reference Lf11 (as shown on the Zonal Masterplan in **Figure 2.3**). The watercourse flows south-east away from the Site.

13.5.7. Metheringham Beck is located outside of the Site boundary and is approximately 2km north east from field reference By05 (as shown on the Zonal Masterplan in **Figure 2.3**). The watercourse flows east away from the Site.

13.5.8. The Beck/Ruskington Brook is located outside of the Site Boundary and is approximately 2.5km south-east from field reference E1a (as shown on the Zonal Masterplan in **Figure 2.3**). The watercourse flows south-east away from the Site.

13.5.9. The remaining ditches and watercourses within the Site boundary would be under the jurisdiction of the Lincolnshire County Council (the Lead Local Flood Authority) as they are classified as ordinary watercourses.

13.5.10. Some watercourses are additionally within internal drainage districts and are also under the jurisdiction of Witham First Internal

[183] Environment Agency, Statutory Main River Map. Available online: Statutory Main River Map ([redacted])

Drainage Board. The district broadly encompasses the eastern boundary of the Site namely fields east of By24 and field Bcd110 (as shown on the Zonal Masterplan in **Figure 2.3**).

Water Framework Directive designations

13.5.11. A section of Metheringham Beck (upstream of the main river section and classified as an ordinary watercourse) is located outside of the Site boundary, approximately 100m north from field By01. The watercourse is designated with a moderate ecological status under the Water Framework Directive/River Basin Management Plan (Cycle 3 – 2022).

13.5.12. Dorrington Dike (a main river) as described above is designated with a poor ecological status under the Water Framework Directive/River Basin Management Plan (Cycle 3 – 2022).

13.5.13. Ruskington Beck (The Beck) (a main river) as described above is designated with a moderate ecological status under the Water Framework Directive/River Basin Management Plan (Cycle 3 – 2022).

13.5.14. A Groundwater Source Protection Zone 1 is located within the Site boundary and is centred to the west of Scopwick (shown in **Figure 2.1**).

13.5.15. A Groundwater Source Protection Zone 3 is located within the Site boundary, within Springwell West, broadly at the south-westernmost boundary and to the north west of Blankney and to the south of Bloxham (shown in **Figure 2.1**).

Land use and designations

13.5.16. The Site is not within an area classified as a Drinking Water Safeguard Zone for surface or ground water, nor is it located at a Drinking Water Protected Area.

13.5.17. The Site is currently in agricultural use and therefore comprises permeable surfaces, such that surface water run-off generally infiltrates into the ground or is routed to the various ditches/drains that bisect the Site.

Sensitive receptors

13.5.18. The Water Stress Map[184], produced by the Environment Agency

[184] Figure 1: map showing results of water stress classification, Water stressed areas – final classification 2021 Version 1.0, Environment Agency, 1 July 2021. Available online: https://www.gov.uk/government/publications/water-stressed-areas-2021-classification

and published 1 July 2021[185], identifies the Site within an area deemed seriously water stressed, where water resources are being or are likely to be exploited to a degree which may result in pressure on the environment or water supplies both now and in future. The Site is shown on the map as within Area 2 – Anglian Water, with a 'serious' classification.

13.5.19. There are to be 24 permanent staff members working at the Proposed Development during operation. Assuming the water usage per staff member is 145 litres per day (based on typical usage guidance[186]) then it is assumed water usage could reach 3480 litres per day, or 3.48 cubic metres of water. In line with **Table 13.4**, this would identify the Site as a low sensitivity receptor as water usage is >50 cubic meters per day and is for commercial use.

13.5.20. During the construction phase there will be an increased, but temporary, demand on water resources for construction activities such as groundworks (drilling etc), potable water for site cabins, and equipment cleaning (tools, wheel washing etc). Concrete is to be pre-mixed and brought to Site, therefore reducing demand on water resources on Site. Though total water usage for the construction phase is still to be determined, the activities would not be expected to exceed 50 cubic metres per day. Therefore, during the construction phase, this would identify the Site as a **low** sensitivity receptor.

13.5.21. The proximity of WFD classified water bodies in the Witham Lower Operational Catchment have been assessed against the location of the Site boundary and the extent of the study area.

13.5.22. There is one WFD classified waterbody which is within the study area, located approximately 100m north outside of the northern Site boundary. This is identified as Metheringham Beck waterbody.

13.5.23. The pathways from the Site to the receptor waterbody can be demonstrated through surface water flood extents which are available from the Environment Agency nationalised risk from surface water flood mapping[187]. The mapping of the surface water flood extents provides an indicative analysis of the expected overland flow pathways which are produced by flood modelling and considers the land topography which is a dominant factor in the directional flow of overland flows.

[185] Water stressed areas – final classification 2021 Version 1.0, Environment Agency, 1 July 2021, accessed 02 October 2023 available at: https://www.gov.uk/government/publications/water-stressed-areas-2021-classification

[186] How much water do you use?, accessed 19 September 2023 at: [redacted]

[187] Environment Agency. Long term flood risk: surface water mapping. Available online: Check the long term flood risk for an area in England - GOV.UK (www.gov.uk)

13.5.24. Baseline conditions of Metheringham Beck waterbody are outlined in **Table 13.7** below as per the classification item status. The baseline conditions are obtained from the Environment Agency Catchment Data Explorer resource which is available online at https://environment.data.gov.uk/catchment-planning/ (accessed 13 September 2023).

13.5.25. Reasons For Not Achieving Good status (RNAG) for Metheringham Beck waterbody are outlined in **Table 13.8** below.

13.5.26. As Metheringham Beck is given a moderate ecological status, the watercourse is classed as being of **medium** sensitivity.

Table 13.7 Metheringham Beck waterbody classification status

Classification Item	2016	2019	2022
Ecological	Moderate	Moderate	Moderate
Physio-chemical quality elements	N/A	Moderate	Moderate
Ammonia (Phys-Chem)	N/A	High	High
Biochemical Oxygen Demand (BOD)	N/A	High	High
Dissolved oxygen	N/A	Good	High
Phosphate	N/A	Poor	Poor
Temperature	N/A	n/a	High
pH	N/A	High	High
Hydromorphological Supporting Elements	Supports Good	Supports Good	Supports Good
Hydrological Regime	Supports Good	Supports Good	Supports Good
Supporting elements (Surface Water)	Moderate	Moderate	Moderate
Mitigation Measures Assessment	Moderate or Less	Moderate or Less	Moderate or Less

Table 13.8 Reasons for not achieving good status at Metheringham Beck waterbody

Significant Water Management Issue	Activity	Category	Classification Element
Point source	Sewage discharge (continuous)	Water Industry	Phosphate
Physical modification	Other	Agriculture and rural land management	Mitigation Measures Assessment
Physical modification	Other	Local and Central Government	Mitigation Measures Assessment
Measures delivered to address reason, awaiting recovery	Not applicable	No sector responsible	Mercury and Its Compounds
Measures delivered to address reason, awaiting recovery	Not applicable	No sector responsible	Polybrominated diphenyl ethers (PBDE)

Public Water Supplies

13.5.27. Consultation will be undertaken with Anglian Water to identify public water abstractions and the potential for the use of the public water supplies as part of the ongoing assessment. The responses will inform the evolving design and will be reported in the ES.

Private Water Supplies

13.5.28. Consultation will be undertaken to identify private water supplies within the Site as part of the ongoing assessment. The response will inform the evolving design and will be reported in the ES.

Abstractions and Discharge Consents

13.5.29. The environmental database reports provided in the appendices

of the Preliminary Risk Assessment report[188] (see **Appendix 10.1**) have been analysed to determine the number of abstraction and discharge consents in the study area. From the data available, there are approximately 41 active[189] discharge and abstraction consents within the study area, comprising 13 discharge consents and 28 abstraction consents. Of these, eight of the consents are within the Site boundary, comprising eight abstraction consents, two are abstraction from surface water and six are for abstraction from groundwater.

Future baseline

13.5.30. There is unlikely to be any change to the baseline position with respect to the hydrological regime or waterbodies within the study area as there is no known reasoning for works to be undertaken on the watercourses or changes in point source pollution in the future. These features are unlikely to change significantly by natural processes.

13.5.31. The Metheringham Beck waterbody does not currently achieve a good status due to the presence of the sewer discharge from the nearby sewer treatment works. There are no known reasons why the sewer discharge from the sewer treatment works will change.

13.6. Likely effects, additional mitigation and residual effects

Construction phase

Table 13.9 Assessment of likely effects, additional mitigation and residual effects during construction

Receptor/ Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
Metheringham Beck	Likely effects	Construction activities including top soil stripping and stockpiling of material, establishment of construction compounds and access tracks, reprofiling and vegetation clearance will have the potential to result in silt laden runoff arising from on-site construction activities, resulting in the sedimentation and pollution of watercourses, which could significantly degrade the receiving WFD classified waterbody.

[188] Springwell Solar Farm, Preliminary Risk Assessment, 1922604 R01 (00), RSK Environment Ltd, November 2022

[189] Where a revocation date has not been supplied for the consent, it has assumed the consent is still active.

Receptor/ Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
	Additional (secondary and tertiary) mitigation	Measures to control silt/soil laden runoff produced during construction activities will be documented within and secured by the Outline Construction Environmental Management Plan and through the provision of an Outline Surface Water Drainage Strategy. Such measures will ultimately prevent silt laden runoff that may arise from the construction phase from reaching the receptor waterbody via overland flow pathways. Such measures would potentially include collecting surface water run-off from hard standing area in a sump, geotextile silt-fences around excavations and exposed ground, stockpiles to prevent the uncontrolled release of sediments from the Site, and installation of sediment traps on all surface water drains within the Site boundary.
	Likely residual effects	The sensitivity of Metheringham Beck is considered to be **medium** based on the moderate ecological status, and with the mitigation in place in line with the Outline Construction Environmental Management Plan, the magnitude of impact would be **negligible**. Therefore, the significance of effect is considered to be **negligible** and **not significant**.
Water resources	Likely effects	During construction, the Proposed Development will increase the demand on water resources compared to the existing scenario as potable water will be required for the staff on site and raw water required for construction activities. Water supplied from private abstraction from the ground would be considered a worst case scenario given the Environment Agency has identified the Site as within a water stressed area. Environment Agency guidance states water abstraction from the ground for over 20 cubic metres of water per day will require a licence.

Receptor/ Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
		The volumes of water usage and the sources of water supply are to be determined and will be considered in the design.
	Additional (secondary and tertiary) mitigation	If it is expected that water abstraction would exceed 20 cubic meters of water per day during the construction period then additional water would be brought in by bowser to provide sufficient supply for construction activities.
	Likely residual effects	The sensitivity of the local water resource is considered to be **low**. Confirmation of the water usage requirements of the Proposed Development will need to be determined; however, it is likely with mitigation in place to reduce reliance on water abstraction such as bringing in water from a bowser to reduce water usage to less than 20 cubic meters per day, the magnitude of impact would be **negligible**. Therefore, the significance of effect is considered to be **negligible** and **not significant**.

Operational phase

Table 13.10 Assessment of likely effects, additional mitigation and residual effects during operation

Receptor/ Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
Water resources	Likely effects	During the operational phase of the Proposed Development, there is likely to be an increase on the demand on water resources compared to the existing scenario as potable water will be required for operational staff. It is anticipated that this would be minimal based on approximately 24 permanent staff present during the operational phase. It is calculated 24 staff may use up to 3.48 cubic meters of water a day based on typical usage of water per individual. A worst case scenario assumes that this water will be provided from a private supply using water abstraction.

Receptor/ Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
	Additional (secondary and tertiary) mitigation	Additional mitigation to reduce the water usage during the operational phase will be documented within and secured by the Outline Operational Environmental Management Plan. This would include dual flush systems on toilet facilities to reduce the demand on potable water supplies for staff and best practice measures to reduce water usage.
	Likely residual effects	The sensitivity of the local water resource is considered to be **low** and assuming 3.48 cubic meters of water a day is required for staff, this is considered to be a **negligible** magnitude of impact on water resources. Therefore, the significance of effect is considered **negligible** and **not significant**. If Anglian Water will be responsible for the supply of water, the effects would be anticipated to be lesser still.

Decommissioning phase

Table 13.11 Assessment of likely effects, additional mitigation and residual effects during decommissioning

Receptor/ Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects	
Metheringham Beck	Likely effects	Decommissioning activities could increase the potential for soil erosion where there will be vehicle movements. This will have the potential to result in silt laden runoff arising from on-site activities, resulting in the sedimentation and pollution of watercourses, which could significantly degrade water quality of the receiving WFD classified waterbody.
	Additional (secondary and tertiary) mitigation	Measures to control silt/soil laden runoff produced during decommissioning activities will be documented within and secured by the Outline Decommissioning Environmental Management Plan, which would avoid, minimise or mitigate effects on the water environment. This would include best practice procedures to mitigate against erosion and manage the timing and conditions of the decommissioning activities.

Receptor/ Matter	Likely Effects/Additional (Secondary and Tertiary) Mitigation/Residual Effects
	Likely residual effects: The sensitivity of the local water resource is considered to be **medium**. With mitigation in place in line with the Outline Decommissioning Environmental Management Plan, the magnitude of impact would be **negligible**. Therefore, the significance of effect is considered to be **negligible** and **not significant**.

Assessment against future baseline

13.6.1. Climate change may result in more frequent and severe storms in the UK with high intensity rainfall events. This is not anticipated to impact on water resources or water quality, however, this will be considered as part of the Flood Risk Assessment and Outline Surface Water Drainage Strategy which will be submitted in support of the DCO application. Climate change factors for increases in rainfall will be taken into account for surface water drainage calculations and Flood Risk Assessment.

13.7. Opportunities for environmental enhancement

13.7.1. The cessation of agricultural activity at the Site could lead to the stabilisation of soils and may reduce soil laden runoff into non-designated watercourses on Site. A reduction in the application of herbicides, pesticides or fertilizers as a result of changes in land management from agricultural producer to solar farm will result in a reduction of surface water runoff from the Site polluted with herbicides, pesticides or fertilizers.

13.8. Intra-project combined effects

13.8.1. 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 water assessment. For example, this could include impacts on water receptors due to mobilisation of the soils during construction. The intra-project combined effects will be presented within the ES once relevant assessments are further progressed.

13.8.2. Inter-project effects are assessed and presented in **Chapter 15: Cumulative Effects**.

13.9. Difficulties and uncertainties

13.9.1. 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.

13.9.2. The ability for Anglian Water to provide a potable water mains supply to the Site for staff welfare facilities is currently unknown.

13.10. Further work to inform the ES

13.10.1. Consultation is ongoing with Anglian Water to confirm the provision of a potable water mains supply to the Site for staff welfare facilities.

13.10.2. A Flood Risk Assessment will be undertaken, which will inform the ongoing design. The Flood Risk Assessment will be submitted in support of the DCO application, and in parallel with the preparation of the ES.

13.10.3. The Flood Risk Assessment will be based on desktop studies of flood risk in line with the principles outlined by the Environment Agency and Department for Environment, Food and Rural Affairs (Defra) guidance for preparing a flood risk assessment17 and will be made using the data available for the fluvial and the surface water flood risk and establishing which areas of the Proposed Development are at risk from these flood risk sources. The assessment will consider the vulnerability of those using the Site, including arrangements for safe access and escape.

13.10.4. A quantitative assessment will be made whether the Proposed Development will cause an increase in flood risk elsewhere either as a result of modifications to the flood plain or changes in ground permeability which can alter the surface water runoff from the Site. The assessment will be made by calculating greenfield runoff rates from the Site and ensuring surface water runoff rates from proposed areas of impermeability as a result of construction do not exceed existing greenfield runoff rates. The quantitative assessment into runoff rates will also consider the requirements for SuDS to mitigate against any potential increases in runoff rates from impermeable constructed areas.

13.10.5. Through the implementation of the Outline Surface Water Drainage Strategy, the Flood Risk Assessment will, if practicable, identify and secure opportunities to reduce the causes and impacts of flooding overall, making as much use as possible of natural flood management techniques as part of an integrated approach to flood risk management.

14. Glint and Glare

14.1. Introduction

14.1.1. This chapter presents the preliminary environmental information and a preliminary assessment of the effects of glint and glare during operation of the Proposed Development. Whilst solar panels are specifically designed to absorb, not reflect, irradiation solar panels may reflect the sun's rays at certain angles, causing glint and glare. Glint is defined as a momentary flash of light that may be produced as a direct reflection of the sun in the solar panel. Glare is a continuous source of excessive brightness experienced by a stationary observer located in the path of reflected sunlight from the face of the panel.

14.1.2. Whilst glint and glare could be triggered as the panels are installed during construction, the likely worst case of any glint and glare impacts would be once the whole solar farm is constructed (i.e. operational). For this reason, this assessment focuses on the operation of the Proposed Development.

14.1.3. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR), with particular reference to **Appendix 4.1 - 4.3** presented in **Volume 3**.

14.2. Consultation and study area

Consultation undertaken to date

14.2.1. An Environmental Impact Assessment (EIA) Scoping Report, presented in **Appendix 4.1**, setting out the proposed approach to glint and glare was submitted to the Planning Inspectorate in March 2023. A Scoping Opinion, presented in **Appendix 4.2**, was issued by the Planning Inspectorate on behalf of the Secretary of State in May 2023. The Planning Inspectorate agreed with the approach to scope out a glint and glare ES factor chapter and to instead prepare a detailed glint and glare stand-alone report; however, it has been requested that the report is included as a technical appendix to the ES that assesses the worst case scenario and, where glint and glare effects are identified, is used to inform the relevant chapters in the ES.

14.2.2. **Appendix 4.3** provides responses to comments relating to glint and glare in the Scoping Opinion and details how these have been addressed in this preliminary assessment.

14.2.3. Outside of the EIA Scoping process, the Applicant will be agreeing with relevant stakeholders the proposed study area and receptors that will inform the glint and glare assessment that will be appended to the ES. No specific consultation has been undertaken to inform

this preliminary assessment.

Study area

14.2.4. There is no formal guidance with regard to the maximum distance at which glint and glare should be assessed. However, based on industry best practice and past assessment experience, the following study areas are considered appropriate:

- 1km for ground-based receptors including residential dwellings and national and regional roads (A15, B1191 and B1188). This is due to that in majority of cases, the possibility of a solar farm being visible to a resident or road user will diminish with distance, with terrain and shielding by vegetation which is likely to obstruct the observers' view.
- 15km study area for aviation receptors. The approach for determining the receptor locations on the approach path is undertaken by selecting locations along the runway centre line from 50ft above the runway threshold out to a distance of 2 miles. The approach phase (arrival flight paths) is considered in the estimation of impact as this is deemed to be the most sensitive phase of a flight. Departing aircraft will have the nose pointing upwards and the visibility of objects (i.e. reflective panels) located on the ground will be reduced and therefore this has not been considered.
- 500m from the Site boundary to railway signal and train driver receptors.

14.3. Legislative framework, planning policy and guidance

14.3.1. There is no formal legislation relating to glint and glare.

14.3.2. Planning policy relevant to glint and glare is summarised below:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)[190] provides the basis for decisions regarding nationally significant energy infrastructure. Sections 5.4 and 5.9 are related to the planning policy for glint and glare, including civil and military aerodromes and landscape and visual.
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[191] – Sections 3.10.93-97, 3.10.125-127 and 3.10.149-150 give specific consideration to glint and glare and sets out the relevant planning policy

[190] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[191] 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

and decision making framework. Section 3.10.150 gives particular reference to aviation and glint and glare stating that '*whilst there is some evidence that glint and glare from solar farms can be experienced by pilots and air traffic controllers in certain conditions, there is no evidence that glint and glare from solar farms results in significant impairment on aircraft safety. Therefore, unless a significant impairment can be demonstrated, the Secretary of State is unlikely to give any more than limited weight to claims of aviation interference because of glint and glare from solar farms'.*

- Planning Practice Guidance for Renewable and Low Carbon Energy - Paragraph 013 sets out guidance for ground mounted solar farms and details particular factors a local planning authority will need to consider and gives reference to the need to consider landscape and visual impact, and the effect on landscape of glint and glare on neighbouring uses and aircraft safety.

14.3.3. Guidelines exist in the UK (produced by the Civil Aviation Authority) and in the USA (produced by the Federal Aviation Administration) with respect to solar developments and aviation activity. However, the UK CAA guidance is relatively high-level and does not prescribe a formal methodology[192].

14.3.4. In the absence of any formal guidance, the full assessment will be carried out in accordance with industry best practice and 4th edition of the solar photovoltaic and building development glint and glare guidance[193] issued by Pager Power in September 2022.

14.4. Sensitive receptors

14.4.1. The Proposed Development has the potential for glint and glare effects on the following receptors:

- Road users within 1km of the Site boundary of the Proposed Development;
  - Three roads have been identified, including A15, B1191 and B1188 which have the potential for glint and glare impacts.
  - All roads within 1km of the Site boundary have been reviewed; however, further technical modelling has not been undertaken to consider local roads as is not recommended where traffic densities are likely to be relatively low. Any solar reflections from the Proposed

[192] Civil Aviation Authority. Interim Guidance – Solar Photovoltaic Systems (2010). Available online: [redacted]

[193] Pager Power. Solar Photovoltaic and Building Development – Glint and Glare Guidance. Fourth Edition (2022). Available online: [redacted]

Development that are experienced by a road user along a local road would be considered low impact in the worst case, in accordance with the Pager Power guidance[194].

- Occupants of residential dwellings within 1km of the Site boundary of the Proposed Development;
  - 189 residential dwelling receptor points have been identified.
- Aviation receptors within 15km of the Site;
  - RAF Cranwell;
  - Griffin's Farm Airstrip;
  - Cottage Farm Airstrip;
  - Old Manor Farm Airstrip;
  - Hanbeck Farm Airstrip;
  - RAF Waddington;
  - Millfield Farm Airstrip;
  - RAF Coningsby; and
  - RAF Barkston Heath.
- 500m from Railway operations and infrastructure.
  - Six railway signal receptors have been identified.
  - Receptor points along the assessed section of railway line have been identified, based on a train driver's eye level typically 2.75m above rail level as informed by previous consultation with Network Rail.
- Pedestrians/observers along public rights of way (PRoW).

14.4.2. Pedestrians/observers along PRoW have not been assessed in this preliminary assessment as no significant effects are predicted and therefore, the full modelling has not been completed. Pedestrian/observers along PRoW will be included within the assessment detailed within the Environmental Statement. Based on professional experience, pedestrians/observers along PRoW are low-sensitivity receptors. This is due to the following reasons:

- The typical density of pedestrians on a PRoW is low in a rural environment;
- Any resultant effect is much less serious and has far lesser consequences than, for example, solar reflections experienced towards a road network, whereby the resultant impacts of solar reflect can be serious to safety;
- Glint and glare effects towards receptors on a PRoW are transient and time and location sensitive, where a pedestrian

[194] Pager Power. Solar Photovoltaic and Building Development – Glint and Glare Guidance. Fourth Edition (2022). Available online: [redacted])

could move beyond the solar reflection zone with ease and little impact upon safety or amenity; and

- There is no safety hazard associated with reflections towards an observer on a footpath.

14.4.3. Furthermore, it is determined that any likely effect will have a low magnitude due to the following reasons:

- It is likely that the existing and the proposed screening is predicted to fully remove the visibility of the Proposed Development for PRoW users; and
- The reflection intensity is similar for solar panels and still water (and significantly less than reflections from glass and steel) which is frequently a feature of the outdoor environment surrounding PRoW. Therefore, the reflections are likely to be comparable to those from common outdoor sources whilst navigating the natural and built environment on a regular basis.

14.5. Methodology

Design assumptions

14.5.1. **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 **Figure 2-3**.

14.5.2. The preliminary glint and glare assessment has been undertaken based on the maximum extent of solar development as presented in **Figure 2-3** to ensure a likely worst case scenario is assessed.

Assessment methodology

14.5.3. The methodology for the glint and glare assessment has been developed based on industry best practice, available guidance and professional experience. It comprises the following stages and will be assessed utilising the Pager Power guidance[195]:

- Identification of key sensitive receptors outlined above that may have potential impacts within and in the surrounding environment of the Proposed Development in accordance with the study areas for each receptor type.

[195] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: [redacted])

- Use of modelling and geometric reflection calculations considering the direct solar reflections towards the key receptors.
- Consideration of existing vegetation and visibility of the panels from the receptor.
- Determination of the significance of impact for each receptor as outlined below in further detail. Where a solar reflection is predicted, consideration is given to the mitigation (screening) between the receptor and the reflecting solar panels.
- For aviation activity, where a solar reflection is predicted, solar intensity calculations are undertaken where appropriate in line with the Sandia National Laboratories' FAA methodology[196]. The scenario in which a solar reflection can occur for all receptors is then identified and discussed, and a comparison is made against the available solar panel reflection studies to determine the overall impact.

Residential dwelling receptors

14.5.4. A solar panel produces a solar reflection and therefore the light reflected is less intense than direct sunlight because a percentage of the light is absorbed by the solar panel. Shadow flicker is the effect of the varying light levels directly from the Sun;

14.5.5. The presence of shadow flicker would be a new effect experienced at a dwelling. Solar panels produce solar reflections of similar intensity to those from still water or glass for example, both common reflective sources next to dwellings.

14.5.6. Shadow flicker guidance[197] states that effects for more than 30 minutes per day, over 30 hours of the year, is significant and requires mitigation. Considering the information presented within the Pager Power Guidance[198] and the above, it is deemed appropriate to consider the effects of glint and glare less significant than shadow flicker. Therefore, the duration beyond which mitigation should be required for glint and glare is longer than for shadow flicker.

[196] Ho, Clifford, Cheryl Ghanbari, and Richard Diver. 2009. Hazard Analysis of Glint and Glare From Concentrating Solar Power Plants. SolarPACES 2009, Berlin Germany. Sandia National Laboratories.
[197] Draft PPS18: Renewable Energy Annex 1 Wind Energy Planning Issues: Shadow Flicker and Reflected Light, Planning Portal Northern Ireland (the shadow flicker recommendations are based on research by Predac, a European Union sponsored organisation promoting best practice in energy use and supply which draws on experience from Belgium, Denmark, France, the Netherlands and Germany). Available Online: Best Practice Guidance to PPS 18 'Renewable Energy' | Department for Infrastructure (infrastructure-ni.gov.uk)
[198] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Fourth-Edition.pdf (pagerpower.com)

14.5.7. Therefore, as recommended in the Pager Power Guidance[199], if visible glint and glare is predicted for a surrounding dwelling for longer than 60 minutes per day, for three or more months of the year, then the impact should be considered significant with respect to residential amenity. In this scenario, mitigation should be implemented.

14.5.8. For residential dwelling receptors, the key considerations are:

- Whether a reflection is predicted to be experienced in practice.
- The duration of the predicted effects, relative to thresholds of:
  - 3 months per year.
  - 60 minutes on any given day.

14.5.9. Where no solar reflections are geometrically possible or where solar reflections are predicted to be significantly screened, no impact is predicted, and mitigation is not required.

14.5.10. Where effects are predicted to be experienced for less than 3 months per year and less than 60 minutes on any given day, or where the separation distance to the nearest visible reflecting panel is over 1km and in this case beyond the study area, the impact significance is low, and mitigation is not proposed at this stage.

14.5.11. Where effects are predicted to be experienced for more than 3 months per year and/or for more than 60 minutes on any given day, expert assessment of the following factors is required to determine the impact significance:

- Whether visibility is likely from all storeys – the ground floor is typically considered the main living space and has a greater significance with respect to residential amenity.
- The separation distance to the panel area – larger separation distances reduce the proportion of an observer's field of view that is affected by glare.
- Whether the dwelling appears to have windows facing the reflecting area – factors that restrict potential views of a reflecting area reduce the level of impact.
- The position of the sun – effects that coincide with direct sunlight appear less prominent than those that do not.

14.5.12. Following consideration of these factors, where the solar reflection does not remain significant, a low impact is predicted, and mitigation is not proposed at this stage. Where the solar reflection remains

[199] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Fourth-Edition.pdf (pagerpower.com)

significant, the impact significance is moderate, and mitigation is recommended. Should mitigation be required, this is usually in the form of landscape planting or opaque fencing which will be designed to reduce any impacts and will be secured within the DCO.

14.5.13. Where effects are predicted to be experienced for more than 3 months per year and more than 60 minutes per day and there are no mitigating factors, the impact significance is high, and mitigation is required.

Road users

14.5.14. The key considerations for road users along major national, and regional roads are:

- Whether a reflection is predicted to be experienced in practice.
- The location of the reflecting panel relative to a road user's direction of travel.

14.5.15. Where no solar reflections are geometrically possible or where solar reflections are predicted to be significantly screened, no impact is predicted, and mitigation is not required.

14.5.16. Where reflections originate from outside of a road user's main field of view (50 degrees either side of the direction of travel), or where the separation distance to the nearest visible reflecting panel is over 1km, the impact significance is low, and mitigation is not recommended, in line with the Pager Power guidance[200].

14.5.17. Where reflections are predicted to be experienced from inside of a road user's main field of view, expert assessment of the following factors is required to determine the impact significance:

- Whether visibility is likely for elevated drivers (applicable to dual carriageways and motorways only) – there is typically a higher density of elevated drivers (such as HGVs) along dual carriageways and motorways compared to other types of roads.
- Whether a solar reflection is fleeting in nature. Small gap/s in screening (e.g., an access point to the site) may not result in a sustained reflection for a road user.
- The separation distance to the panel area – larger separation distances reduce the proportion of an observer's field of view that is affected by glare.

[200] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)

- The position of the sun – effects that coincide with direct sunlight appear less prominent than those that do not.
- Whether the solar reflection originates from directly in front of a road user – a solar reflection that is directly in front of a road user is more hazardous than a solar reflection to one side.

14.5.18. Following consideration of these mitigating factors, where the solar reflection does not remain significant, a low impact is predicted, and mitigation is not recommended. Where the solar reflection remains significant, the impact significance is moderate, and mitigation is recommended.

14.5.19. Where reflections originate from directly in front of a road user and there are no mitigating factors, the impact significance is high, and mitigation is required. Should mitigation be required, this is usually in the form of landscape planting or opaque fencing which will designed to reduce any impacts and will be secured within the DCO.

Railway receptors

14.5.20. The key considerations for quantifying impact significance for train driver receptors are:

- Whether a reflection is predicted to be experienced in practice;
- The location of the reflecting panel relative to a train driver's direction of travel;
- The workload of a train driver experiencing a solar reflection, which comprises the following factors;
    - Visibility of the signal from within the solar reflection zone.
    - The complexity of the railway i.e section of railway line where for example, there are multiple lines with switches and points, station approach, signals and road or pedestrian crossing.

14.5.21. Where reflections are geometrically possible but expected to be screened through existing vegetation, no impact is predicted, and mitigation is not required.

14.5.22. Where reflections originate from outside of a train driver's primary horizontal field of view (30 degrees either side of the direction of travel), or the closest reflecting panel is over 500m from the railway user, the impact significance is low, and mitigation is not

recommended, in line with the Pager Power guidance[201].

14.5.23. Where reflections are predicted to be experienced from inside of a train driver's primary field of view, expert assessment of the following mitigating factors is required to determine the impact significance and mitigation requirement:

- Whether the solar reflection originates from directly in front of a train driver. Solar reflections that are directly in front of a train driver are more hazardous;
- The separation distance to the reflecting panel area. Larger separation distances reduce the proportion of an observer's field of view that is affected by glare;
- The position of the sun. Effects that coincide with direct sunlight appear less prominent than those that do not. The Sun is a far more significant source of light; and
- Whether a signal, station, level crossing, or switching point is located within the reflection zone.

14.5.24. Following consideration of these factors, where the solar reflection does not remain significant, a low impact is predicted, and mitigation is not proposed at this stage.

14.5.25. Where reflections originate from directly in front of a train driver and there are no further mitigating factors, the impact significance is high, and mitigation is required. As this preliminary assessment shows, there are no reflections that are rated as high in significance. Indeed, there are no expected impacts from glint and glare on the railway.

Aviation receptors

14.5.26. The approach phase (arrival flight paths) is considered in the estimation of impact as this is deemed to be the most sensitive phase of a flight. Departing aircraft will have the nose pointing upwards and the visibility of objects (i.e. reflective panels) located on the ground will be reduced and therefore this has not been considered in this preliminary assessment.

14.5.27. For the runway approach paths, in line with the Pager Power guidance[202], the key considerations are:

- Whether a reflection is predicted to be experienced in practice.

[201] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)
[202] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)

- The location of glare relative to a pilot's primary field of view (50 degrees either side of the approach bearing).
- The intensity of glare for the solar reflections:
    - Glare with 'low potential for temporary after-image' (green glare).
    - Glare with 'potential for temporary after-image' (yellow glare).
    - Glare with 'potential for permanent eye damage' (red glare).
- Whether a reflection is predicted to be operationally significant in practice or not. To determine whether the solar reflections with the potential for temporary after-image can be operationally accommodated, the following factors are considered:
    - The likely traffic volumes and level of safeguarding at the aerodrome – licensed aerodromes typically have higher traffic volumes and are formally safeguarded;
    - The time of day at which glare is predicted and whether the aerodrome will be operational such that pilots can be on the approach at these times;
    - The duration of any predicted glare – glare that occurs for low durations throughout the year is less likely to be experienced than glare that occurs for longer durations throughout the year;
    - The location and size of the reflecting panel area relative to a pilot's primary field-of-view;
    - The location of the source of glare relative to the position of the sun at the times and dates in which solar reflections are geometrically possible – effects that coincide with direct sunlight appear less prominent than those that do not;
    - The level of predicted effect relative to existing sources of glare – a solar reflection is less noticeable by pilots when there are existing reflective surfaces in the surrounding environment.

14.5.28. Where no solar reflections are geometrically possible or where solar reflections are predicted to be significantly screened, no impact is predicted, and mitigation is not required.

14.5.29. Where solar reflections are of an intensity no greater than 'low potential for temporary after-image' (green glare) or occur outside of a pilot's primary field of view (50 degrees either side of the approach bearing), the impact significance is low, and mitigation is not recommended.

14.5.30. As detailed in the Pager Power guidance, where solar reflections are of an intensity no greater than 'low potential for temporary after-

image' expert assessment of the following relevant factors is required to determine the impact significance:

- The likely traffic volumes and level of safeguarding at the aerodrome. Licensed aerodromes typically have higher traffic volumes and are formally safeguarded. Unlicensed aerodromes have greater capacity for operational acceptance.
- The time of day at which glare is predicted. Will the aerodrome be operational such that pilots can be on the approach at the time of day at which glare is predicted?
- The duration of any predicted glare. Glare that occurs for low durations throughout the year is less likely to be experienced than glare that occurs for longer durations throughout a year.
- The location of the source of glare relative to a pilot's primary field of view (50 degrees either side of the approach bearing). Do solar reflections occur directly in front of a pilot?
- The relative size of the reflecting panel area. Does the reflecting area make up a large percentage of a pilot's primary field of view?
- The location of the source of glare relative to the position of the sun at the times and dates in which solar reflections are geometrically possible. Effects that coincide with direct sunlight appear less prominent than those that do not.
- The intensity of the predicted glare. Is the intensity of glare close to the green/yellow glare threshold on the intensity chart?
- The level of predicted effect relative to existing sources of glare. A solar reflection is less noticeable by pilots when there are existing reflective surfaces in the surrounding environment.

14.5.31. Following consideration of these factors, where the solar reflection does not remain significant a low impact is predicted and mitigation is not recommended.

14.5.32. Where solar reflections are of an intensity greater than 'potential for temporary after-image', the impact significance is high, and mitigation is required. As this preliminary assessment shows, there are no reflections that are rated as high in significance. Indeed, there are no expected impacts from glint and glare on aviation receptors.

Significance criteria

14.5.33. A summary of the significance criteria, derived from the Pager

Power guidance[203], has been used to determine the level of glint and glare effects is presented in **Table 14.1**.

Table 14-1 Significance criteria

Significance	Definition	Mitigation Requirement
No Impact	A solar reflection is not geometrically possible or will not be visible from the assessed receptor	No mitigation required
Low	A solar reflection is geometrically possible however any impact is considered to be small such that mitigation is not required e.g. intervening screening will limit the view of the reflecting solar panels significantly	No mitigation required
Moderate	A solar reflection is geometrically possible and visible however it occurs under conditions that do not represent worst-case given individual receptor criteria outlined in the associated guidance[204]	Mitigation recommended
High	A solar reflection is geometrically possible and visible under worst-case conditions that will produce significant impact given individual receptor criteria outlined in the associated guidance[205]	Mitigation will be required if the Proposed Development is to proceed

14.5.34. A preliminary assessment, which has included modelling and consideration towards the existing vegetation screening that is present within the intervening landscape, has been undertaken. This has been carried out in parallel with the design evolution of the Proposed Development to help inform the iterative design and landscaping strategy.

[203] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)
[204] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)
[205] Solar Photovoltaic and Building Development – Glint and Glare Guidance (Fourth Edition) (September 2022). Available Online: Solar-Photovoltaic-Glint-and-Glare-Guidance-Third-Edition.pdf (pagerpower.com)

14.6. Likely effects and mitigation

14.6.1. This preliminary assessment has identified that the majority of the Proposed Development will have low or no glint and glare impacts.

14.6.2. This preliminary assessment has identified that there are no likely significant effects anticipated on aviation receptors.

14.6.3. This preliminary assessment has identified that there are no likely significant effects anticipated on railway receptors.

14.6.4. Apart from the one property below, this preliminary assessment has identified that there are no likely significant effects anticipated on residential properties.

14.6.5. The preliminary assessment identified one property as having moderate impacts due to effects being predicted to be experienced for more than three months per year but less than 60 minutes per day, and due to the lack of existing sufficient mitigating factors such as full intervening screening. These impacts are being reviewed and mitigated to remove those moderate impacts through best practice mitigation strategies, which will likely include landscaping and hedgerow planting to fill existing gaps or other design changes, including layout modifications and alterations to the angles of the Solar PV modules, if required.

14.6.6. A small section of the A15 on the northbound section, located in the south of Springwell West, before reaching the B1191 junction has been identified as having a potential moderate/high impact and these too are currently being considered further as part of the ongoing design evolution of the Proposed Development and as part of developing mitigation for any glint and glare impacts, which includes landscaping and hedgerow planting in these areas. Other mitigation measures, such as layout modifications and alterations to the angles of the Solar PV modules, are also being considered to remove the glint and glare impacts.

14.6.7. Apart from the small section of the A15, there are no likely significant effects anticipated on the B1191 and B1188.

14.6.8. The assessment outputs have helped inform the design of the Proposed Development and the mitigation strategy. The mitigation and landscaping strategy is being developed to remove moderate and above impacts, with the intention that the design of the Proposed Development to be submitted in the DCO application will produce low or no glint and glare impacts and the effects would be reduced to minor and not significant.

14.6.9. A full glint and glare technical assessment will form an appendix to the ES, as required by the Scoping Opinion, which will assess the submitted design and identify any required additional mitigation.

14.6.10. Landscape planting that is required to mitigate any glint and glare impacts will be documented within and secured by the Outline

Landscape and Ecological Management Plan.

14.7. Difficulties and uncertainties

14.7.1. The information provided in this PEIR is preliminary and is based on the information available at the time of writing. The final assessment of impacts will be reported in the ES.

14.7.2. The preliminary assessment has been undertaken using high level modelling to determine the potential effects of the maximum extent of Solar PV development. The full glint and glare assessment will be informed by the design of the Proposed Development included in the DCO application and the parameters that will inform the ES.

14.8. Further work to inform the ES

14.8.1. The impacts are being considered as part of the ongoing design evolution of the Proposed Development and as part of developing mitigation for any glint and glare impacts, such as landscaping and hedgerow planting. The landscape design is being progressed to inform the ES and proposed planting will be considered in the full glint and glare assessment.

14.8.2. A full glint and glare assessment will be informed by the design of the Proposed Development to be submitted in support of the DCO application and will form a technical appendix to the ES.

15. Cumulative Effects

15.1. Introduction

15.1.1. This chapter presents the approach to the cumulative effects assessment, including preliminary consideration of the potential for cumulative effects, and proposed actions to be completed as part of the ongoing EIA.

15.1.2. This chapter is intended to be read as part of the wider Preliminary Environmental Information Report (PEIR) with particular reference to **Appendix 15.1**. Cumulative effects occur as a result of several actions on an environmental receptor which may overlap or act in combination. The following types of cumulative effects have been considered in accordance with the EIA Regulations and best practice guidance:

- Intra-project combined effects – the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor; and
- Inter-project cumulative effects – the combined residual (post-mitigation) effects of the Proposed Development and another project or projects on a single receptor/resource.

15.2. Legislative framework, planning policy and guidance

15.2.1. Schedule 4(5)(e) of the EIA Regulations states that the ES should include *"a description of the likely significant effects of the development on the environment resulting from… the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources".*

15.2.2. Regulation 5(2) states that the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors…..population and human health, biodiversity, land, soil, water, air and climate, material assets, cultural heritage and the landscape. Regulation 5(2)(e) refers to the need to assess "*the interaction between those factors*".

15.2.3. Planning policy relevant to cumulative assessment includes the following:

- Overarching National Policy Statement for Energy (NPS EN-1) (2011)[206] provides the basis for decisions regarding nationally significant energy infrastructure. There are multiple references to cumulative assessment including paragraph 4.2.4 which notes that the ES should provide information on how the effects of the applicant's proposal would combine and interact with the effects of other development, and paragraph 4.2.6 which refers to a need to consider how the accumulation of, and interrelationship between, effects might affect the environment, economy or community as a whole, even though they may be acceptable when considered on an individual basis with mitigation measures in place.
- Draft Overarching National Policy Statement for Energy (NPS EN-1) (2023)[207] includes multiple references to cumulative assessment including paragraph 4.1.5 which requires that potential adverse impacts, including on the environment, and including any long-term and cumulative adverse impacts, as well as any measures to avoid, reduce, mitigate or compensate for any adverse impacts are considered.
- National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2011)[208] sets out the policies relating to electricity generation from renewable sources of energy and includes multiple references to cumulative assessment. However, solar farms are not explicitly included within the document.
- Draft National Policy Statement for Renewable Energy Infrastructure (NPS EN-3) (2023)[209] - Section 3.10 gives specific consideration to solar development including assessment of cumulative impacts.
- National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2011)[210] - Paragraph 2.8.2 makes reference to cumulative landscape and visual impacts where new overhead lines are required along with other related

[206] Overarching National Policy Statement for Energy (EN-1) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[207] 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
[208] National Policy Statement for Renewable Energy Infrastructure (EN-3) (2011). Available online: https://www.gov.uk/government/publications/national-policy-statements-for-energy-infrastructure
[209] Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) (2023). Available online: https://www.gov.uk/government/consultations/planning-for-new-energy-infrastructure-revisions-to-national-policy-statements
[210] National Policy Statement for Electricity Networks Infrastructure (EN-5) (2011). Available online: 1942-national-policy-statement-electricity-networks.pdf (publishing.service.gov.uk)

developments such as substations, wind farms and/or other new sources of power generation.

- Draft National Policy Statement for Electricity Networks Infrastructure (NPS EN-5) (2023)[211] - Paragraph 2.9.10 makes reference to cumulative adverse landscape and visual impacts that may arise where new overhead lines are required along with other related developments such as substations, wind farms, and/or other new sources of generation.

15.2.4. There is no widely accepted methodology for assessing cumulative effects, although various best practice and guidance documents exist. Relevant guidance has been considered during the preparation of this PEIR and will also be employed in the production of the ES, including from the Institute of Environmental Management and Assessment (IEMA)[212], and the assessment guidance set out in PINS Advice Note Seventeen: Cumulative Effects Assessment[213] on inter-project cumulative effects.

15.3. Scope of the assessment

15.3.1. The scope of the cumulative assessment is as set out in the EIA Scoping Report (March 2023) and informed by the Scoping Opinion provided by PINS on behalf of the Secretary of State (see **Appendix 4.1**). A summary of the scoping opinion and response to each comment received is provided in **Appendix 4.3**. **Table 15.1** below summarises the key responses relating to the cumulative effects assessment and how these have been or will be addressed.

Table 15.1 Summary of key responses from the scoping opinion in relation to the assessment of cumulative effects

Consultee	Key matters raised	Actions in response to consultee comments
Planning Inspectorate	3.9.1 'No matters have been proposed to be scoped out the assessment'.	Noted.
Planning Inspectorate	3.9.2 'The study areas, methodologies (including other projects included in the	Discussions with North Kesteven District Council and Lincolnshire County

[211] Draft National Policy Statement for Electricity Networks Infrastructure (EN-5) (2023). Available online: EN-5 Electricity Networks National Policy Statement (publishing.service.gov.uk)
[212] Institute of Environmental Management and Assessment (IEMA) (2011). The State of Environmental Impact Assessment in the UK. Available online: 2011-State-of-EIA-IEMA.pdf
[213] Planning Inspectorate (2019). Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (Version 2). Available online: Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects | National Infrastructure Planning (planninginspectorate.gov.uk)/

Consultee	Key matters raised	Actions in response to consultee comments
	assessment) particularly with respect to impacts on 'best and most versatile' (BMV) agricultural land and landscape, should be agreed with the statutory consultation bodies and any exclusions should be clearly justified and explained with reference to PINS Advice Note 17: Cumulative effects assessment.'	Council in relation to study areas and methodology for cumulative effects assessment (including agreement on the list of other projects) will be undertaken as part of the ongoing EIA process. In particular, consideration will be given to the adoption of a wider more regional level study area for the cumulative assessment of BMV agricultural land.
Lincolnshire County Council	Traffic and Transport – 'This chapter of the ES should also consider potential cumulative construction effects (and where relevant operational effects) associated with other large-scale and NSIP scale projects including Triton Knoll, Viking Link, Heckington Fen Solar Park (including works to Bicker Fen Substation), Beacon Fen Energy Park, Temple Oaks Renewable Energy Park and the Lincolnshire Reservoir depending on the timeframes of those projects. The assessment should also consider Town and Country Planning Act 1990 projects including the Sleaford West and potentially the Sleaford South SUEs (A17/A15 corridor), along with the Lincoln South East Quadrant (SEQ) SUE which sits alongside parts of the A15 and B1188.'	The list of potential other projects that may cumulatively affect traffic receptors will be considered as part of the ongoing EIA process, including availability of traffic data, relevant overlap with construction programme and overlap with the study area.

Consultee	Key matters raised	Actions in response to consultee comments
	'The Council disagrees that NSIP projects must lie within the ZoI of the development which is based on the study area for each environmental factor considered in the EIA. The County is currently subject of several other NSIP projects and these all need to be taken into account in terms of potential cumulative effects in particular in respect of LVIA and impacts on BMV agricultural land. Of particular relevance are the following: West Burton Solar Project; Cottam Solar Project; Gate Burton Energy Park; Heckington Fen Solar Park; Mallard Pass Solar Park; Temple Oaks Renewable Energy Park; Tillbridge Solar Project; Beacon Fen Energy Park; Lincolnshire Reservoir.'	The proposed methodology, including the use of a relevant Zone of Influence (ZoI) for each environmental factor, is based on PINS Advice Note Seventeen. In relation to BMV agricultural land, consideration will be given to the adoption of a wider more regional level study area for cumulative assessment. The list of projects within the ZoI for BMV agricultural land will be agreed with North Kesteven District Council and Lincolnshire County Council.
Natural England	'Natural England would like to note the significant number of Solar projects currently proposed in Lincolnshire and the East Midlands. These projects include Cottam Solar Project, West Burton Solar Project, Tillbridge Solar Project, Heckington Fen Solar Park, Gate Burton Solar Project, Mallard Pass Solar Project. As such, it is important that all possible cumulative impacts from these projects on the environment are considered within the ES.'	Consideration will be given to the adoption of a wider more regional level study area for cumulative assessment in relation to BMV agricultural land. The ZoI for cumulative assessment of other factors is as specified in **Table 15.2**.

Consultee	Key matters raised	Actions in response to consultee comments
North Kesteven District Council	Traffic and Transport: 'This should include cumulative construction (and where relevant operational) effects associated with Triton Knoll, Viking Link, Heckington Fen Solar Park (including works to Bicker Fen Substation), Beacon Fen Energy Park, Temple Oaks solar and the Lincolnshire Reservoir depending on the timeframes of those projects. Town and Country Planning Act 1990 projects requiring cumulative assessment of transport effects include the Sleaford West and potentially the Sleaford South SUEs (A17/A15 corridor), along with the Lincoln South East Quadrant (SEQ) SUE which sits alongside parts of the A15 and B1188.'	The list of potential other projects that may cumulatively affect traffic receptors will be considered, including availability of traffic data, relevant overlap with construction programme and overlap with the study area.
	Traffic and Transport: 'Some cumulative transport impacts associated with construction phases might occur across the North Kesteven and South Kesteven/Rutland solar NSIP schemes depending on respective project timescales and construction traffic routeing.'	The list of potential other projects that may cumulatively affect the traffic receptors will be considered, including availability of traffic data, relevant overlap with construction programme and overlap with the study area.
	Land, Soils and Groundwater: 'For the avoidance of doubt the Council suggests that cumulative effects associated with BMV agricultural land impacts (i.e. in relation to 'Land, soils and groundwater') should as a minimum include all of the NSIP solar projects in Lincolnshire at Heckington Fen Solar Park, Beacon Fen	Consideration will be given to the adoption of a wider more regional level study area for cumulative assessment of BMV agricultural land. The list of projects within the ZoI for BMV agricultural land will be agreed with North Kesteven District Council

Consultee	Key matters raised	Actions in response to consultee comments
	Energy Park, Tillbridge Solar, Temple Oaks, Cottam, West Burton, Gate Burton and Mallard Pass along with BMV agricultural land impacts associated with the Lincolnshire Reservoir.'	and Lincolnshire County Council.
West Lindsey District Council	'It is imperative that any Environmental Impact Assessment clearly considers within its structure the cumulative effect of Springwell Solar Farm with these other solar farm projects and any other solar Farms in Central Lincolnshire such as the Fiskerton Solar project, which is an extant development, with consent to expand. There are questions as to how all these developments taken together will affect Central Lincolnshire's character, as traditional rural Lincolnshire Countryside.'	Consideration will be given to the adoption of a wider more regional level study area for cumulative assessment. The list of projects within the ZoI for BMV agricultural land will be agreed with North Kesteven District Council and Lincolnshire County Council. The ZoI for cumulative assessment of other factors is as specified in **Table 15.2**.

15.4. Intra-project combined effects

15.4.1. The approach to the preliminary assessment of interactions of environmental effects (intra-project effects) has considered the changes in baseline conditions at common sensitive receptors (i.e. those receptors that have been identified as experiencing likely significant effects by more than one environmental factor) due to the Proposed Development. The preliminary assessment has been based upon residual (post-additional mitigation) effects of 'slight/minor' or greater significance only ('negligible' residual effects will not be considered). The preliminary assessment includes consideration of where multiple non-significant effects could combine to become significant. The study area for the preliminary assessment of intra-project effects has been informed by the study areas for the individual factor assessments.

15.4.2. Preliminary consideration of the potential for intra-project effects has been undertaken to inform this PEIR and is reported within each

of the environmental factor chapters (**Chapters 5-14**). A full assessment of the potential intra-project effects will be undertaken and detailed within the ES. This will include a summary of the impact interactions and will set out how each of the environmental factor assessments have considered and assessed secondary effects arising as a result of the direct impacts from other environmental factors.

15.4.3. The full assessment of intra-project combined effects, to be presented in the ES, will be undertaken using a two-stage approach:

Stage 1 – Screening

15.4.4. Screening will be undertaken to determine whether a sensitive receptor is exposed to more than one type of residual (post-additional mitigation) effect during the construction, operation and decommissioning phases of the Proposed Development. Those common sensitive receptors exposed to two or more types of residual (post-additional mitigation) effects with significance of 'slight/minor' or greater, will be taken forward to Stage 2 of the assessment.

15.4.5. If there is only one type of effect on a sensitive receptor (i.e. only one technical chapter has identified effects on that sensitive receptor), then it will be considered that there are no potential intra-project combined effects and the sensitive receptor will not be taken forward to Stage 2 of the assessment.

Stage 2 – Assessment of intra-project combine effects

15.4.6. A quantitative assessment of the overall significance of the cumulative effects on common sensitive receptors identified at Stage 1 will be undertaken based on technical information provided in the technical chapters and supporting appendices as well as professional judgement. Given that the types of effects may be very different in some cases, a quantitative assessment may not be possible, and it may be necessary to apply professional judgement in determining the significance of each individual effect.

15.4.7. The evaluation at the receptor level will consider: the magnitude of change at the common receptor; previously identified sensitivity; duration and reversibility of interaction. The focus will be on determining a change in the level of effect likely to be experienced and whether this is significant or not.

15.5. Inter-project cumulative effects

15.5.1. The ES will include an assessment of the potential effects of the Proposed Development in the context of other developments, as detailed below, to determine the cumulative effects that may result

from the Proposed Development and the other development(s) on the same receptor or environmental factor.

15.5.2. The approach to the assessment of inter-project effects will consider the deviation from the baseline conditions at common sensitive receptors as a result of changes brought about as a result of the Proposed Development in combination with one or more other existing development and/or approved developments. The assessment of the inter-project effects will be based upon the residual (post-additional mitigation) effects that have been identified in the various factor assessments for the Proposed Development, as well as available environmental information for the other existing development and/or approved developments.

15.5.3. In accordance with PINS Advice Note Seventeen[214], the identification of other existing development and/or approved developments comprises two clear stages as follows:

- Stage 1: establish a long list of other existing development and/or approved developments based on appropriate spatial and temporal limits.
- Stage 2: apply a clear rationale to establish a shortlist of other existing development and/or approved developments which, in combination with the Proposed Development, have the potential to result in a significant cumulative effect for inclusion within the assessment.

15.5.4. For the purposes of this preliminary assessment, Stages 1 and 2 have been completed in order to identify a preliminary short list of other existing development and/or approved developments to inform a high level overview of potential cumulative effects.

Stage 1: Long list methodology

15.5.5. In accordance with PINS Advice Note Seventeen, the first task in establishing the long list of relevant 'other existing development and/or approved development(s)' is to determine the 'search area'. For the purposes of this preliminary assessment, the 'search area' has been determined by affording consideration to the Zone of Influence (ZoI) for each environmental factor assessed within this PEIR.

15.5.6. The ZoI for each environmental factor is defined as the spatial area over which an effect is likely to be experienced. The ZoI for each environmental factor has been identified based on the extent of the likely effects as identified as the study area in each of the individual environmental factor chapters (**Chapters 5-14**), whilst also

[214] Planning Inspectorate Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects (2019). Available online: Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects | National Infrastructure Planning (planninginspectorate.gov.uk)

reflecting any additional area over which cumulative effects may occur for particular cumulative scenarios (e.g. sequential cumulative visual effects on users of linear routes).

15.5.7. The environmental factor-specific study areas presented in **Chapters 5-14**, and appropriate justifications for these study areas, are provided below in **Table 15.2**.

Table 15.2 Zone of influence for each environmental factor

Environmental Factor	Zone of Influence	Justification
Biodiversity	2km from the Site (extended to 10km in certain circumstances)	Background data searches for statutory and non-statutory designated sites and protected species records focus on the Site and a 2km buffer, extended to 10km for Special Protection Areas (SPAs), Special Areas of Conservation (SACs) and Ramsar sites. Therefore, the Site and 2km surrounding is considered to be the ZoI.
Air quality	250m from the Site	Based on the Institute of Air Quality Management (IAQM) construction dust guidance (IAQM, 2023)[215], the study area for sensitive human receptors for demolition, earthworks and general construction activities is up to 250m from the Site boundary. For trackout[216] activities, the study area is up to 50m from the edge of the roads likely to be affected by trackout. The study area for sensitive ecological receptors for demolition, earthworks and general construction activities is up to 50m from the Site boundary. For trackout activities, the study area is up to 50m from the edge of the roads likely to be affected by trackout.
Cultural heritage	10km from the Site	The ZTVs presented in **Figures 9.5-9.9** demonstrate that any visibility of the Proposed Development, including the Springwell Substation, would be limited to a maximum distance of 5km from the

[215] Institute of Air Quality Management. Guidance on the assessment of dust from demolition and construction. (2023). Available online: construction-dust-2014.pdf (iaqm.co.uk)
[216] Trackout is defined as the transport of dust and dirt from the construction/demolition sites onto public road network, where it may be deposited and then re-suspended by vehicles using the network.

Environmental Factor	Zone of Influence	Justification
		Site. In theory, there could be in combination effects to heritage assets within this distance of the Site as a result of other developments of a similar height within 5km of the asset and the ZoI for cultural heritage is therefore set at 10km from the Site.
Climate	Not applicable (global)	Greenhouse Gas (GHG) emissions are inherently cumulative, where the sensitive receptor is the global climate. As such, it is not possible to define a ZoI for the assessment of cumulative effects on GHG emissions.
Landscape and visual	10km from the Site	The ZTVs presented in **Figures 9.5-9.9** demonstrate that any visibility of the Proposed Development, including the Springwell Substation, would be limited to a maximum distance of 5km from the Site. In theory, sequential cumulative visual effects on users of linear routes (e.g. roads or long distance recreational footpaths) could be influenced by developments beyond the ZoI of the Proposed Development itself. In order to consider this scenario, the ZoI for the cumulative LVIA is set at 10km from the Site.
Land, soils and groundwater (excluding BMV agricultural land)	1km from the Site	1km buffer has 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.
Noise and vibration	300m from the Site (for construction and decommissioning) Approximately 1km from the Site (for operation)	The study area for the construction and decommissioning phase assessments considers noise and vibration sensitive receptors that are located within 300m of the Site boundary. This has been determined based on the guidance set out in BS 5228-1: 2009+A1: 2014, BS

Environmental Factor	Zone of Influence	Justification
		5228-2: 2009+A1: 2014[217] and DMRB 'LA 111 - Noise and Vibration[218]. For the assessment of operational phase noise levels, the study area extends out to the nearest or most exposed noise sensitive receptors to the Site boundary.
Traffic and transport	Extent of the local road network including: B1202 B1188 B1191 A15	Extent of the local road network affected by the construction, operation and decommissioning phases, as well as any identified sensitive receptors. This study area has been identified assuming that all construction traffic routes to the Proposed Development will follow these links for access.
Water	1km from the Site	A 1km study area has been considered with regard to identifying hydrological features and surface water related receptors that could be impacted by the construction, operation and/or decommissioning of the Proposed Development.

15.5.8. With reference to **Table 15.2** above, the overall combined 'search area' for the long list of relevant 'other existing development and/or approved development(s)' has been based on the largest ZoI in terms of distance, which in this case is **10km**. However, and notwithstanding the above, consideration is being afforded to the adoption of a wider more regional level study area for cumulative assessment in relation to BMV agricultural land (as noted in **Table 15.1**). Therefore, the long list of other existing development and/or approved development(s) may be updated within the ES as required to reflect the agreed ZoI for BMV agricultural land.

15.5.9. Following the adoption of the 10km ZoI, a planning application search was undertaken to identify other existing development and/or approved developments within the 10km ZoI, using the planning portals of North Kesteven District Council, Lincolnshire County Council and PINS.

[217] BSI Standards Publication BS 5228-1:2009+A1:2014. Code of practice for noise and vibration control on construction and open sites. Part 1- Noise. Available online: untitled (warrington.gov.uk)
[218] Design Manual for Roads and Bridges. LA 111 Noise and Vibration (2020). Available online: cc8cfcf7-c235-4052-8d32-d5398796b364 (standardsforhighways.co.uk)

15.5.10. The 10km ZoI extends from the 'bounding circle' surrounding the Site boundary of the Proposed Development, as presented on **Figure 15.1**. The central National Grid Reference point of other existing development and/or approved developments has been used to determine their location, in the absence of an application boundary in GIS format.

15.5.11. Only the following types of other existing developments and/or approved developments have been considered for inclusion on the long list, as the Applicant considers that any development that does not fall within these types would not likely give rise to a significant cumulative effect:

- Employment developments;
- Residential developments of 10+ dwellings;
- Minerals and waste applications;
- NSIP developments[219];
- Transport infrastructure developments (trunk roads or motorways only); and
- Energy infrastructure developments.

15.5.12. Furthermore, of the development types listed above, only those that meet one or more of the following criteria have been included on the long list (in accordance with the 'Tier 1' and 'Tier 2' descriptions in Table 2 of Advice Note Seventeen):

- Projects that are under construction but that will not be completed prior to the Proposed Development commencing (N.B. in accordance with Table 2 of PINS Advice Note Seventeen, other projects that are expected to be completed before construction of the Proposed Development, and the effects of those projects have been fully determined within their respective applications, are considered as part of the baseline);
- Projects with planning permission within the last five years[220] (whether under the Planning Act 2008 or other regimes), but not yet implemented;
- Submitted applications (whether under the Planning Act 2008 or other regimes), but not yet determined;
- Projects on the Planning Inspectorate's Programme of Projects where an EIA Scoping Report has been submitted, but for which an application has not yet been submitted.

[219] As defined by the Planning Act 2008 (as amended)
[220] A five-year period is considered a reasonable time period to capture all other existing development and/or approved developments that still have the potential to be built. Developments with planning permission older than five years will likely have been built or will not likely be built at all.

15.5.13. The Applicant's interpretation of last bullet point above is that this solely relates to NSIPs. However, the Applicant has chosen to widen this particular criterion to include projects screened as EIA development under other regimes where an EIA Scoping Report has been submitted, but for which an application has not yet been submitted.

15.5.14. It should be noted that with reference to 'Tier 3' descriptions in Table 2 of PINS Advice Note Seventeen, the following other existing development and/or approved development(s) have not been considered for inclusion in the long list, as none of the below will have sufficient environmental assessment information freely and publicly available to inform the inter-project cumulative effects assessment, nor are any of the below considered by the Applicant to be 'existing development and/or approved development':

- Projects on the Planning Inspectorate's Programme of Projects where an EIA Scoping Report has not been submitted;
- Projects that have been identified in the relevant Development Plan(s) (and emerging Development Plans); and
- Projects identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

15.5.15. The Applicant's interpretation of first bullet point above is that this solely relates to NSIPs. However, the Applicant has chosen to widen this particular criterion to include projects screened as EIA development under other regimes where an EIA Scoping Report has not been submitted.

15.5.16. The long list of other existing development and/or approved development(s) is provided in **Appendix 15.1**. This long list will be kept under review and agreed with North Kesteven District Council and Lincolnshire County Council prior to the completion of the ES to allow for a robust assessment of cumulative effects.

15.5.17. It should be noted that several other existing developments and/or approved developments have not met the above criteria and have therefore not been included in the long list. This includes a large residential development north of Ruskington (20/0391/FUL), located within 0.5km from the Site, which is currently under construction and assumed to be operational by 2026. Therefore, in accordance with PINS Advice Note Seventeen, this has been considered as part of the baseline.

Stage 2: Shortlist methodology

15.5.18. Following the formation of the long list, the eligible other existing development and/or approved developments identified have been through further assessment (Stage 2) to establish a short list of other existing development and/or approved developments which, in combination with the Proposed Development, have the potential to result in significant cumulative effects.

15.5.19. The criteria used to determine whether to include or exclude an existing development and/or approved development on the shortlist reflects the process established by PINS Advice Note Seventeen and has regard to relevant policy and guidance documents and consultation with the appropriate statutory consultation bodies (particularly the local planning authority). PINS Advice Note Seventeen states that the criteria should address the following:

- *"**Temporal scope:** The applicant may wish to consider the relative construction, operation and decommissioning programmes of the 'other existing development and/or approved development' identified in the ZOI together with the programme, to establish whether there is overlap and any potential for interaction.*
- ***Scale and nature of development**: The applicant may wish to consider whether the scale and nature of the 'other existing development and/or approved development' identified in the ZOI are likely to interact with the proposed development. Statutory definitions of major development and EIA screening thresholds may be of assistance when considering issues of scale.*
- ***Other factors:** The applicant should consider whether there are any other factors, such as the nature and/or capacity of the receiving environment that would make a significant cumulative effect with 'other existing development and/or approved development' more or less likely and may consider utilising a source-pathway-receptor approach to inform the assessment.*
- ***Documentation:** The CEA shortlisting process may be documented using Matrix 1 (Appendix 1)* (N.B. **Appendix 15.1** adopts the structure and format of Matrix 1)*. The reasons for excluding any development from further consideration should be clearly recorded. This will provide decision makers, consultation bodies and members of the public with a clear record of 'other existing development and/or approved development' considered and the applicant's decision making process with respect to the need for further assessment."*

15.5.20. PINS Advice Note Seventeen suggests that professional

judgement may also be used to supplement the threshold criteria and in order to avoid excluding 'other existing development and/or approved development' that is:

- *"Below the threshold criteria limits but has characteristics likely to give rise to a significant effect; or*
- *Below the threshold criteria limits but could give rise to a cumulative effect by virtue of its proximity to the proposed NSIP* [i.e. the Proposed Development]".

15.5.21. PINS Advice Note Seventeen also notes *"Similarly, professional judgement could be applied to support excluding 'other existing development and/or approved development' that exceeds the thresholds but may not give rise to discernible effects. All of the 'other existing development and/or approved development' considered should be documented and the reasons for inclusion or exclusion should be clearly stated*."

15.5.22. Taking the above into consideration, the other existing development and/or approved developments on the long list has been reviewed against the following criteria to form the shortlist of other existing development and/or approved developments:

- **Criteria 1**: The other existing development and/or approved development has a construction, operational and/or decommissioning phase that overlaps with any phase of the Proposed Development;
- **Criteria 2**: The other existing development and/or approved development and the Proposed Development share common sensitive receptors/resources which are assessed and described in the supporting environmental documentation, and have the potential to be significantly affected by the combination of the other existing development and/or approved development and the Proposed Development; and
- **Criteria 3**: The other existing development and/or approved development has sufficient environmental assessment information freely and publicly available to inform the inter-project cumulative effects assessment. The assessment of each existing development and/or approved development on the shortlist will be proportionate to the environmental assessment information available (N.B: An attempt will not be made to assess the potential environmental effects of any other development to inform the inter-project cumulative effects assessment. If there is an existing development and/or approved development that it is known will be progressed but has insufficient environmental assessment information, it still may be prudent to consider it in the inter-project cumulative effects assessment. This might take the

form of listing the project and why it hasn't been considered in detail, or the potential cumulative effect could be discussed at a high level (qualitatively) using professional judgement).

15.5.23. Where an existing development and/or approved development meets all of the above criteria, it has been included on the 'short list' and will be taken forward for further consideration in the assessment. The 'short list' is detailed below in **Table 15.3**. This short list will be kept under review and agreed with North Kesteven District Council and Lincolnshire County Council prior to the completion of the ES to allow for a robust assessment of cumulative effects.

15.5.24. It should be noted that whilst the Applicant recognises that Fosse Green Energy (application reference EN010154) and Heckington Fen Solar Park (application reference EN010123) fall outside of the 10km ZoI, they have been included in the short list as both are very close to the edge of the 10km ZoI and both projects are similar in nature to the Proposed Development. Therefore, in the interests of transparency, the Applicant considers that it would be inappropriate to exclude them.

Table 15.3 Shortlist of other existing development and/or approved development

Application Reference	Planning regime	Brief description	Distance from the Proposed Development	Status	Within 10km ZoI?
20/0029/FUL	Town and Country Planning Act 1990	Erection of 329 no. dwellings, formulation of new access points from Sleaford Road and Dunston Road, provision of new internal access roads, and, provision of new sustainable drainage infrastructure	0.37km North East	Approved – Operation proposed for 2026	Yes
EIA/37/22	Town and Country Planning Act 1990	Proposed construction of an Anaerobic Digestion Plant and associated infrastructure	2km North East	Pre-application (scoping opinion received) – Construction year unknown	Yes
23/0390/EIASCO	Town and Country Planning Act 1990	Navenby Heath 400MW Battery Storage Development	2km NW	Pre-application (scoping opinion received) – Construction year unknown	Yes
EN010151	Planning Act 2008	Beacon Fen Energy Park	7.45km South East	Pre-Application – Construction is anticipated to start in 2026 (subject to consent) Operation timeframe - 60 years	Yes

Application Reference	Planning regime	Brief description	Distance from the Proposed Development	Status	Within 10km ZoI?
EN010154	Planning Act 2008	Fosse Green Energy	11.24km NW	Pre-Application - Construction anticipated to commence 2031. Operation expected to commence 2033.	No
EN010123	Planning Act 2008	Heckington Fen Solar Park	12.97km SE	Examination - Construction will commence, at the earliest, in the Spring 2025 for 30 months. Earliest operation Autumn 2027.	No

15.5.25. Where developments have been discounted from the shortlist, they will continue to be monitored to ensure that any changes to those projects are identified and their omission from the shortlist is reassessed prior to undertaking the cumulative assessment for the ES.

Stage 3: Information gathering

15.5.26. The other existing development and/or approved developments that form part of the shortlist are subject to a review of environmental information, where available, including details of:

- Location;
- Programme, including construction, operation and decommissioning;
- Baseline data;
- Effects arising from such other developments; and
- Proposed design.

Stage 4: Assessment

15.5.27. An initial review of short-listed projects has been undertaken to inform a high level overview of potential cumulative effects for the purposes of this preliminary assessment (see **Section 15.6** below). A further review will be undertaken to inform the full cumulative assessment to be reported in the ES. Should significant cumulative effects be identified, consideration will be given to additional mitigation to avoid, prevent, reduce or, if possible, offset any identified significant adverse cumulative effects

15.5.28. There is no formal guidance on the criteria for determining significance of cumulative effects. For the full assessment to be presented in the ES, the following principles will be considered when assessing the significance of inter-project effects, in accordance with PINS Advice Note Seventeen and in consideration of any mitigation measures required to avoid, prevent, reduce or, if possible, offset any identified significant adverse cumulative effects:

- Is there an inter-project effect on any receptors/resources;
- The duration and frequency of the effects;
- The nature of the receptors/resources affected;
- How the impacts identified combine to affect the condition of the receptor/resource;
- The probabilities of the impacts occurring in relation to each other in such a way so as to produce a cumulative effect, considering the extent and duration of the impact change;

- The ability of the receptor/resource to absorb further impacts; and
- Is the level of effect different to that considered at the project level and is the cumulative effect significant or not.

15.6. Preliminary inter-project cumulative assessment

15.6.1. This section presents a high-level overview of potential cumulative effects based on the short-listed projects presented in **Table 15.3**. Discussions with North Kesteven District Council and Lincolnshire County Council in relation to agreement on study areas and methodology for cumulative effects assessment (including agreement on the list of other projects) will be undertaken as part of the ongoing EIA process and will inform the full assessment of cumulative effects to be reported within the ES.

Air Quality

15.6.2. There are no developments on the short list that lie within the ZoI for air quality (250m) and therefore there is considered to be no potential for cumulative air quality effects.

Biodiversity

15.6.3. There is one approved residential development (20/0029/FUL) *c.* 15ha in size, one proposed anaerobic digestion plant (EIA/37/22) *c.* 8ha in size and one proposed battery storage scheme (23/0390/EIASCO) *c.* 12ha in size, within 2km from the Proposed Development. The main adverse effects of these developments are likely to be habitat loss and disturbance (e.g. noise, householders cats/dogs and lighting which may affect bats). All these developments are proposed on agricultural land, which is a habitat similar to the Site, and therefore similar ecological receptors will likely be affected. The developments are relatively small in comparison to the Proposed Development; however, they could have a combined effect of habitat loss on ground nesting birds and foraging bats. It is assumed that these developments will be subject to the respective mitigation plans agreed with the relevant authorities, and that adverse effects on ecological receptors would be mitigated with no significant effect. It is envisaged that there will be minimal residual impact from the Proposed Development and therefore cumulative effects from the above applications are anticipated to be low.

15.6.4. There are three nationally significant solar farm developments proposed in the area: Beacon Fen Energy Park (c. 7.5km south east); Foss Green Energy (c. 11km north west) and Heckington Fen Solar Park (c. 13km south east) which are at pre-application stage, pre-application approved or pre-examination stages respectively. The three solar development proposals are fairly similar to the

Proposed Development in terms of size, temporal scale, nature of development and likely effects on ecological receptors. The main adverse effects of these solar developments is likely to be habitat loss and disturbance during the construction phase. Operational phase works are anticipated to be relatively low impact and habitat creation/restoration or enhancement, assumed to be carried out after construction, is likely to have some beneficial effects. If construction works for all these developments are carried out at the same time or within an overlapping timeframe with the Proposed Development, then the potential effects of habitat loss and disturbance may be amplified for species such as ground nesting or wintering birds, which use the wider area and may use the different sites as 'stepping stones' for nesting or foraging habitat.

15.6.5. Providing the above schemes adequately mitigate for their individual effects and no significant effects are identified then the potential for cumulative effects is limited. The possibility of a collaborative regional approach to mitigate any adverse effects and/or enhance beneficial effects may be considered by the respective applicants.

15.6.6. The significance of cumulative effects from the identified solar projects will be assessed further in the ES as designs are progressed and further surveys completed.

Climate

15.6.7. Greenhouse gas (GHG) emissions are inherently cumulative, as all emissions have the same impact on the same ultimate receptor (i.e. the global climate). Most developments result in the release of GHGs, and consequently have the potential to result in a cumulative effect. The impact of these emissions is climate change, or global warming, caused by the radiative forcing effects of GHGs in the atmosphere. The affected receptor is the global climate and all the ecosystems and biomes that depend on it.

15.6.8. As the receptor is not geographically constrained it is not appropriate to undertake a conventional cumulative effects assessment. Consideration of cumulative GHG emissions is inherent within the preliminary GHG assessment undertaken as part of this PEIR **(see Chapter 7: Climate)**, as the emissions of the Proposed Development are assessed within the context of local and UK carbon budgets.

Cultural Heritage

15.6.9. The approved residential development (20/0029/FUL) is an extension of Metheringham to the north and there would be no in combination views with the Proposed Development. No significant cumulative effects on heritage assets are anticipated with this development.

15.6.10. The proposed anaerobic digestion plant and associated infrastructure (EIA/37/22) is located on the former RAF Metheringham site and the local planning authority (Lincolnshire County Council) has requested that heritage be scoped into the assessment. At a maximum height of 25.5m, there could be cumulative effects on assets to the north of the Site.

15.6.11. The proposed Navenby Heath battery storage development north of Green Man Road, Navenby (23/0390/EIASCO) is at an early stage of development; the local planning authority has asked that cultural heritage to be scoped into the EIA. With a proposed maximum height of 2.9m, the storage units could result in cumulative effects on assets to the northwest of the Site.

15.6.12. The Beacon Fen Energy Park NSIP proposal is located sufficiently far from the nearest assets that are predicted to be affected by the Proposed Development that significant cumulative effects are considered unlikely.

15.6.13. The Fosse Green Energy and Heckington Fen Solar Park NSIP proposals are both located outside of the ZOI for cultural heritage and significant cumulative effects are therefore considered unlikely.

Landscape and Visual

15.6.14. The approved residential development (20/0029/FUL) is essentially an extension of an existing settlement resulting in extremely localised landscape and visual effects. Any effects associated with 20/0029/FUL would be restricted to the far (northern) side of Metheringham, some distance from the Site. There would be no visibility of the scheme in combination with any views of the Proposed Development. No significant cumulative landscape or visual effects are anticipated with this development.

15.6.15. The proposed Navenby Heath battery storage development north of Green Man Road, Navenby (23/0390/EIASCO) is located 2km to the north of the Proposed Development and both schemes may give rise to locally significant effects on landscape character and visual receptors lying between the two sites. If both schemes were constructed in tandem, it is likely that the cumulative landscape and visual effects in this tract of the landscape would be greater than if either project was constructed in isolation. At the current time, insufficient detail is available regarding the Navenby Heath project to provide a judgement about the likely significance of the cumulative effects arising between these two projects. However, assuming a worst case scenario for both projects, it is possible that a significant cumulative landscape and visual effect may arise.

15.6.16. The solar and energy storage element of the Fosse Green Energy NSIP is located in the vale west of the Lincoln Cliff and would have no visual connection with the Proposed Development, although

indicative grid connection corridor options extend to the A15 north of Springwell. At this time, insufficient information is available regarding the nature of the grid connection from the Fosse Green Energy proposal to form a judgement on likely significant cumulative effects, but it is possible that cumulative landscape and visual effects could arise north of the Site. Further consideration will be given to any additional information that becomes available to inform the cumulative effects assessment to be reported in the ES.

15.6.17. The Beacon Fen Energy Park and Heckington Fen Solar Park NSIP proposals are both located some considerable distance away from the Proposed Development in a different landscape character area (the Fens) and there would be no visual connection with the Proposed Development. No significant cumulative landscape or visual effects are anticipated with either development.

Land, Soils and Groundwater

15.6.18. The ZoI for land, soil and groundwater (excluding BMV agricultural land), identified in **Table 15.2**, is 1km. There is one approved residential development (20/0029/FUL) within 1km of the Site. There is potential for temporary construction related accidental spills to have a combined effect on groundwater receptors. However, it is assumed that the proposed residential development will be subject to the respective mitigation plans agreed with the relevant authorities, and that adverse effects on groundwater receptors would be mitigated and not be significant. In view of this, the probabilities of significant cumulative effects occurring on groundwater is anticipated to be low. No interaction of impact on soils would be expected between the Proposed Development and the approved residential development.

15.6.19. The residential development (20/0029/FUL) that has been consented, comprises permanent, irreversible development of land on the edge of Metheringham. For this site, a significant cumulative loss of BMV land in the context of the BMV land available in Lincolnshire is not anticipated.

15.6.20. Beacon Fen Energy Park, Fosse Green Energy and Heckington Fen Solar Park are NSIP solar developments and therefore have the potential for cumulative effects from the use of BMV land, assuming they are all consented. There is limited data currently available on the total area of BMV land use for Beacon Fen Energy Park and Fosse Green Energy. However, based on an indicative calculation based on publicly available information for Heckington Fen Solar Park and assuming half of the land within the boundary of Beacon Fen Energy Park and Fosse Green Energy comprises BMV land, this would equate to approximately 2,059ha of BMV land use, including the current area of BMV land within the Proposed Development Site.

15.6.21. At this time, provision of a detailed breakdown on area of land which is BMV for this development is not possible due to a lack of data. This development will be considered in further detail within the ES, if this information is publicly available.

15.6.22. The area of BMV agricultural land within Lincolnshire is estimated to be more than 380,000ha, as identified in **Chapter 10: Land, Soils and Groundwater**, based on the provisional mapping, In this context, the Beacon Fen Energy Park, Fosse Green Energy and Heckington Fen Solar Park developments alongside the Proposed Development will use approximately 0.005% of the regional BMV land resource.

15.6.23. In addition, it should be noted that these solar developments are considered to be largely reversible resulting in a limited permanent loss of BMV land. Therefore, in the context of the regional BMV land resource, a significant cumulative effect from the use of BMV land of these developments is not anticipated and it is anticipated that mitigation will be put in place for these developments to ensure ongoing agricultural practices are considered. A further review will be undertaken to inform the full cumulative effects assessment to be reported in the ES.

15.6.24. With respect to potential cumulative effects on BMV agricultural land, consideration will be afforded to the adoption of a wider more regional level study area for cumulative assessment. The list of projects within the ZoI for BMV agricultural land will be agreed with North Kesteven District Council and Lincolnshire County Council as part of the ongoing EIA.

Noise and Vibration

15.6.25. Of those developments listed in **Table 15.3**, The Fosse Green Energy NSIP proposal is considered to be the nearest, with fixed plant infrastructure considered to be located at sufficient distance from the Proposed Development in order to have a negligible impact on the sensitive receptors considered. No significant operational phase impacts are likely from the Proposed Development, and hence cumulative effect is also considered not significant.

15.6.26. It is noted that the indicative Grid Connection Corridor of the Fosse Green Energy NSIP options extend to the A15 north of the Proposed Development. At this time, insufficient information is available regarding the nature of the construction related impacts although it is expected that the construction works would be subject to their own respective mitigation plans which would have been agreed with the regulatory agencies. In view of this, the cumulative impact is considered not significant. Due to different timescales, decommissioning phase cumulative effects are also considered to be not significant.

15.6.27. Metheringham Anaerobic Digestion Plant, which is located 2km north east of the Proposed Development, is considered at sufficient distance to not give rise to cumulative effects during the operational phase. It is expected that the construction works would be subject to their own site specific mitigation measures in order to render potential cumulative effects as not significant.

15.6.28. The Beacon Fen Energy Park and Heckington Fen Solar Park NSIP proposals are considered not significant due to their considerable distance from the Proposed Development.

15.6.29. The proposed Navenby Heath battery storage development is c.3km away from the nearest sensitive receptors considered as part of the Proposed Development; this is considered a sufficient distance to ensure potential cumulative effects are not significant.

15.6.30. Overall, inter-project cumulative effects on noise and vibration sensitive receptors, common to the Proposed Development and other developments, are considered to be not significant.

Traffic and Transport

15.6.31. As noted in **Chapter 12: Traffic and Transport**, due to the extent of baseline information currently known and the maturity of the design of the Proposed Development, this PEIR reports only partial assessment of likely significant traffic and transport effects. The assessment of pedestrian delay; amenity; fear and intimidation; driver delay and highway safety will be reported within the ES once further baseline information has been obtained and the design of the Proposed Development has progressed.

15.6.32. Given this, consideration of cumulative effects on traffic and transport will also be reported within the ES. As noted in **Table 15.1**, the list of other developments that may cumulatively affect traffic receptors will be considered as part of the ongoing EIA process, including availability of traffic data, relevant overlap with construction programme and overlap with the study area. Discussions with North Kesteven District Council and Lincolnshire County Council to agree on the list of other developments will be undertaken as part of the ongoing EIA process.

Water

15.6.33. The ZoI for water, as identified in **Table 15.2**, is 1km. There is one approved residential development (20/0029/FUL) within 1km of the Site. There is potential for temporary construction related accidental spills and/or silt runoff to have a combined effect on surface water receptors. However, it is assumed that the proposed residential development will be subject to the respective mitigation plans agreed with the relevant authorities, and that adverse effects on surface water receptors would be mitigated and not be significant.

In view of this, the probabilities of significant cumulative effects occurring on surface water during construction is anticipated to be low.

15.7. Difficulties and uncertainties

15.7.1. The assessment of inter-project cumulative effects is limited to publicly available information obtained from the relevant planning applications on the North Kesteven District Council, Lincolnshire County Council and PINS planning portals. For the purposes of this preliminary assessment, only an initial review of the short list projects has been undertaken to inform a high level overview of potential cumulative effects. Further review will be undertaken to inform the full cumulative assessment to be reported in the ES.

15.8. Further work to inform the ES

15.8.1. The long list and short list of other existing development and/or approved developments presented within this chapter have not been finalised and agreed at this stage. Further consultation with North Kesteven District Council and Lincolnshire County Council to agree the final short list for inclusion in the ES will be undertaken. Any other developments that are identified will be considered as part of the long list and a decision will be taken in accordance with the methodology detailed in **Section 15.5** to determine whether a particular development will be included in the short list. An assessment cut-off date will be reported within the ES, as advised in PINS Advice Note Seventeen.

Springwell

Solar Farm

Springwell Solar Farm

Preliminary Environmental Information Report

Volume 2
Supporting Figures

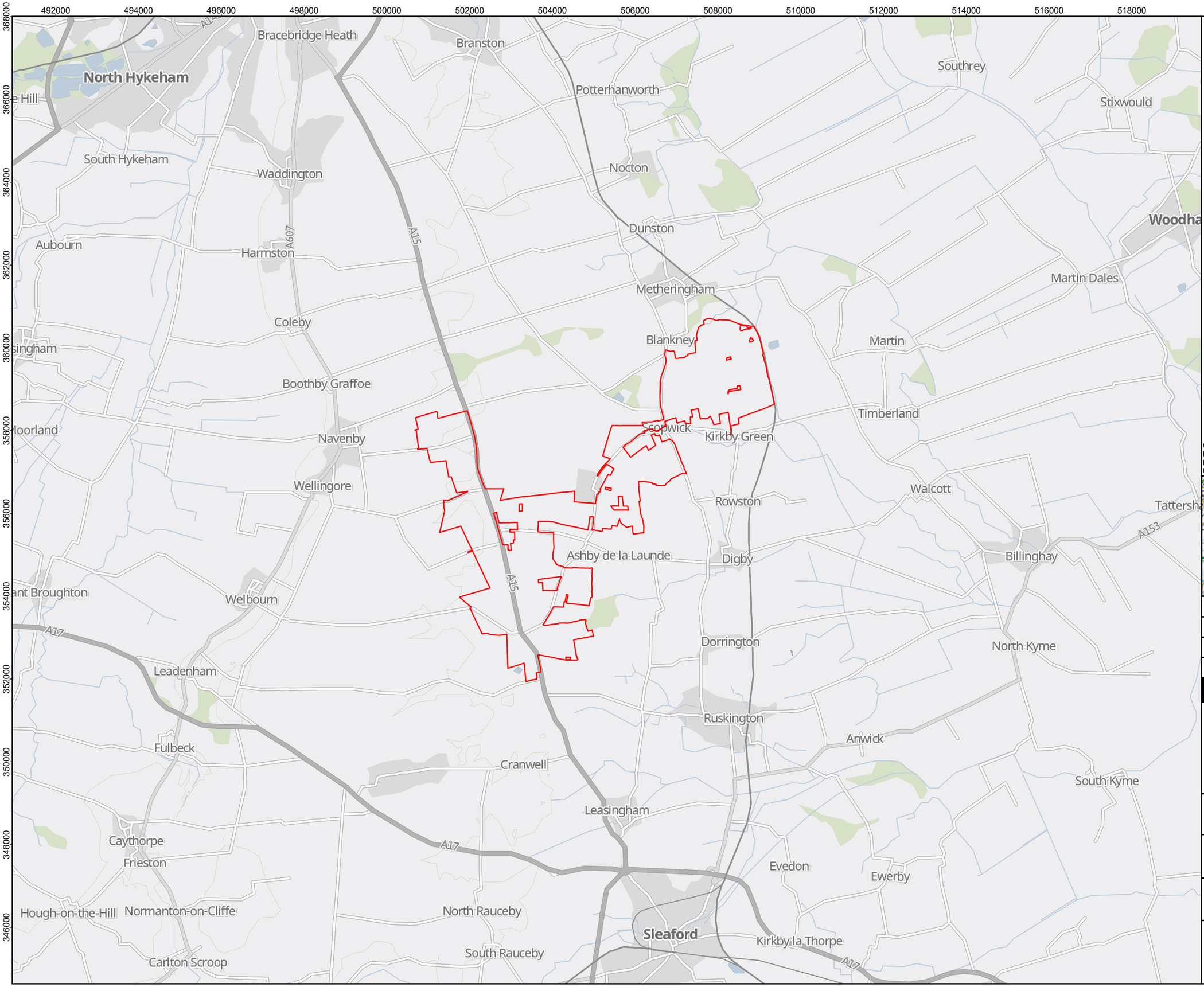
Phase 2 consultation
Springwell Energyfarm Ltd

Table of Contents

Figure 12.3 Traffic and Transport Sensitive Receptors

Figure 15.1 Cumulative Long-List Radius

Figure 1.1
Location Plan

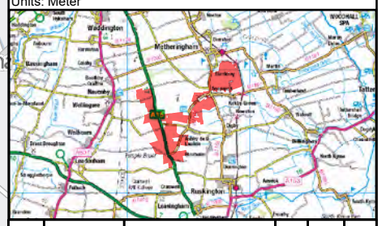


LEGEND:

Indicative Site Boundary (Preferred Order Limits)

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



Rev	Date	Description	Drn	Chk	App
01	02/11/2023	Updated Site Boundary	LDA	SMc	SMc
00	13/07/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

TITLE:
LOCATION PLAN

FIGURE NUMBER:
1.1

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Kilometers

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REV P01

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Figure 2.1
Environmental Features Plan

LEGEND:

- Site Boundary
- Solar Fields
- Residential Properties
- National Grid Towers

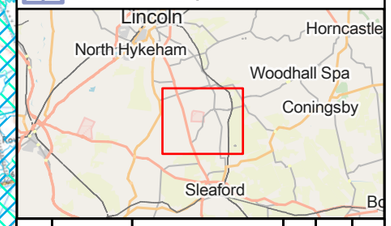
Listed Building Grade

- I
- II
- II*

- Public Rights of Way
- National Grid OHL
- Overhead Lines (132kV)
- Railway
- Priority Hedgerow
- Watercourse
- Watercourses Suitable for Water Vole
- Flood Zone 2
- Flood Zone 3
- Scheduled Monuments
- Conservation Areas
- Ancient Woodland
- Local Wildlife Sites (indicative)
- Grassland Suitable for Reptiles

Source Protection Zones

- Zone I - Inner Protection Zone
- Zone III - Total Catchment



Rev	Date	Description	Drn	Chk	App
06	22/11/2023	Updated Legend	DL	JG	DP
05	09/11/2023	Updated LWS	FA	JG	DP
04	22/11/2023	New RLB	FA	JG	DP

Springwell Solar Farm

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

DOCUMENT:
P663620_envFeatPlanOverall_A3L

TITLE:
Environmental Features Plan

FIGURE NUMBER:
Figure 2.1

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Kilometers

Scale: 1:35,000 @ A3

REV 06

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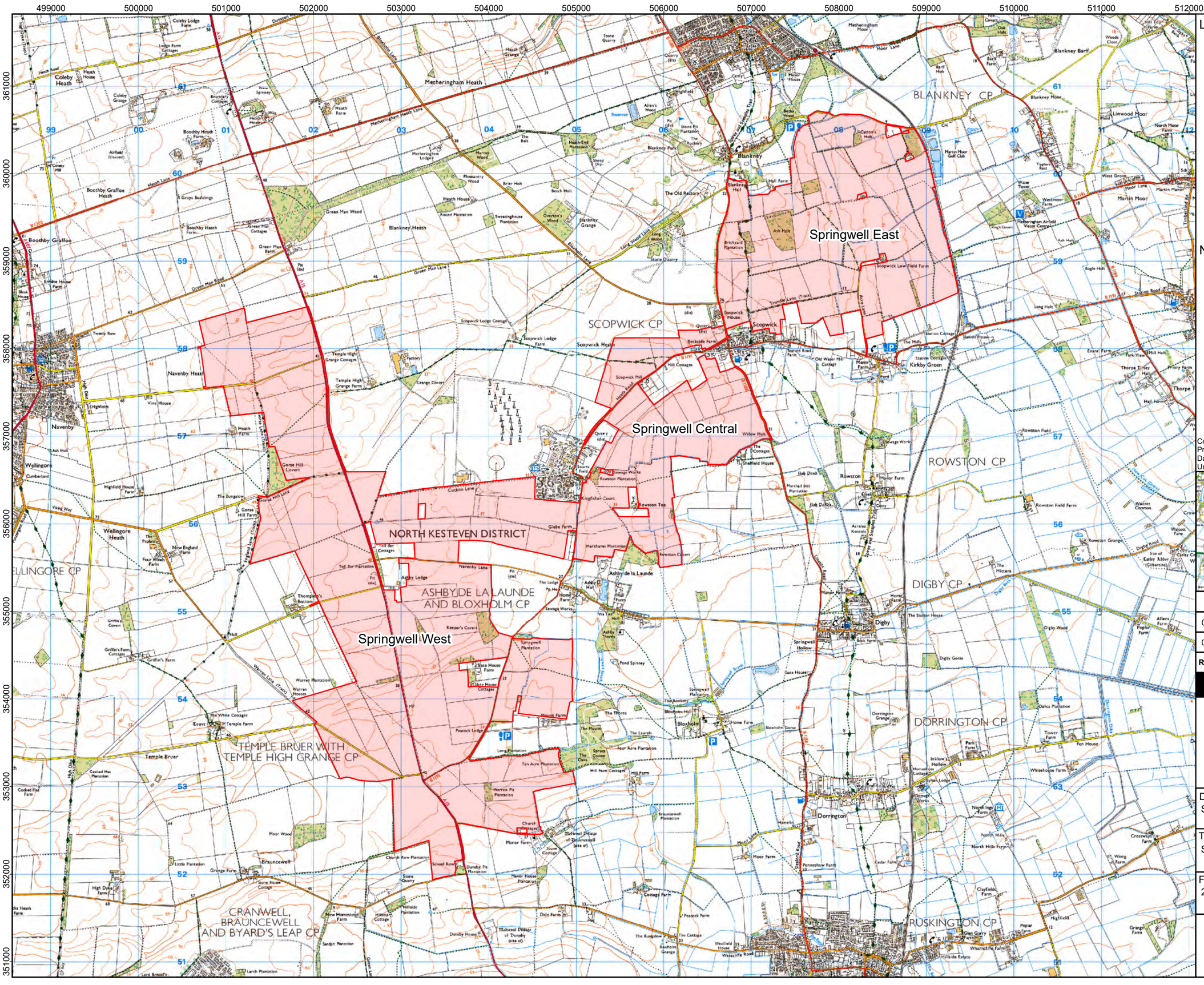
Figure 2.2
Site Boundary



LEGEND:

Indicative Site Boundary (Preferred Order Limits)

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	02/11/2023	Updated Site Boundary	LDA	SMc	SMc
00	13/07/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

TITLE:
SITE BOUNDARY

FIGURE NUMBER:
2.2

0 0.5 1
Kilometers

Scale: 1:40,000 @ A3

REV P01

Path: Z:\8622_EDF_Renewables_Acre_Lane\8gis\Projects\PIER_Figures\PEIR_Figure_2_2_Site_Boundary.aprx\Map

Figure 2.3
Zonal Masterplan

KEY:

- Indicative Site Boundary (Preferred Order Limits)
- Indicative area for Solar PV development
- Indicative area for mitigation, enhancement and/or retained agricultural land
- Indicative siting zone for BESS
- Indicative siting zone for Satellite Collector Compounds
- A — Indicative siting zone for Springwell Substation and Main Collector Compound
- Indicative site access location
- Indicative siting zone for Grid Connection Corridor

NOTES:

1. The location of features shown are indicative only. Exact locations to be confirmed on site.
2. Additional features may be present on site that have not been identified on the topographical plan.
3. Parameter plan drawings are based on OS MasterMap information.
4. The following components are not shown on the parameter plan drawings: cable route corridors, boundary fencing and CCTV, inverter and transformers and switchgear compounds, internal access tracks, drainage, construction access and compounds.

App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

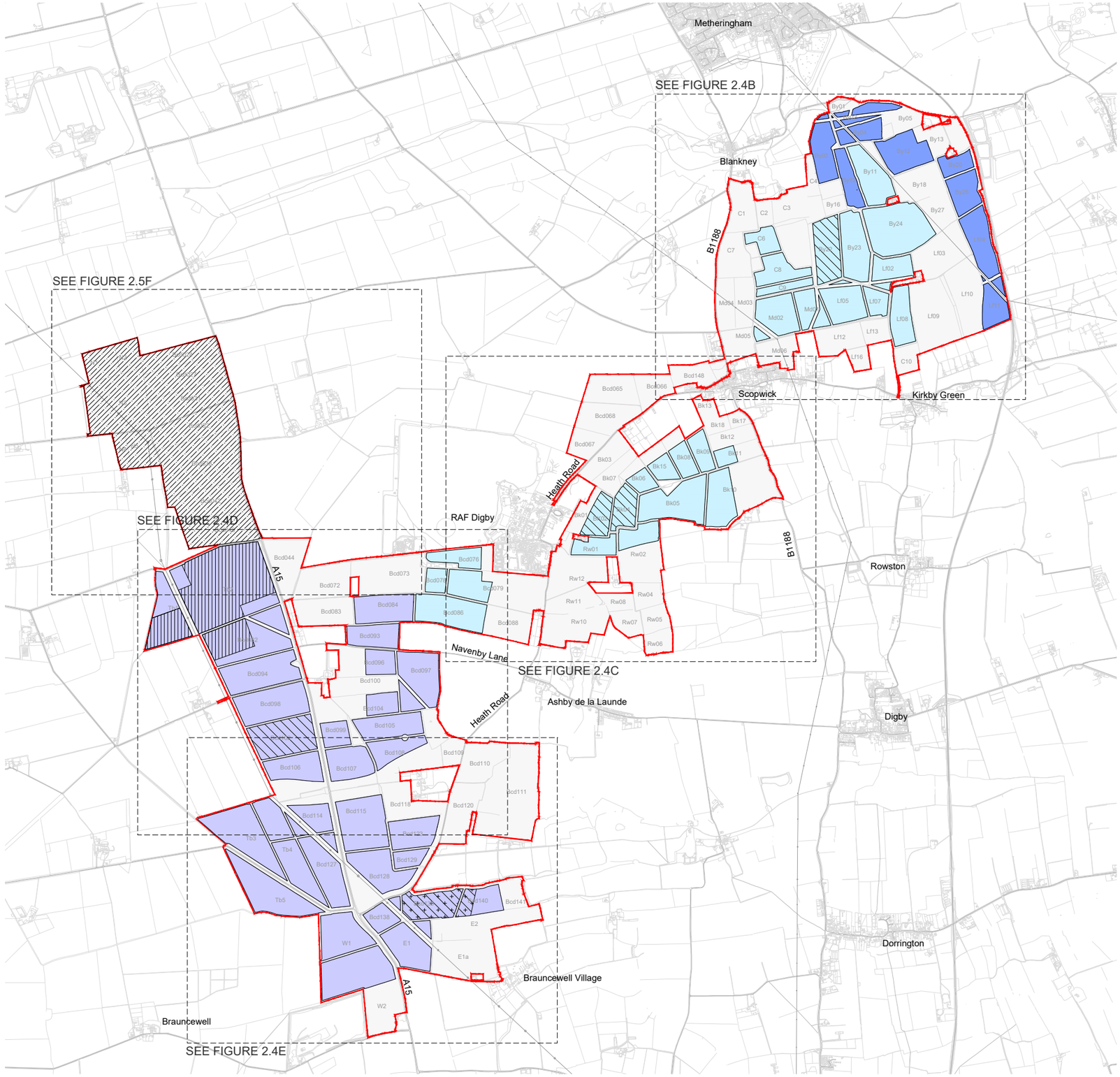
TITLE:
ZONAL MASTERPLAN

FIGURE NUMBER:
2.3

SCALE : 1:40,000 @ A3 (0 – 2.5km)

REV: P01

Figure 2.4
Indicative Height Parameters Plan



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Indicative maximum height above ground level (meters)

- Proposed development up to 3m
- Proposed development up to 3.5m
- Proposed development up to 4m
- Proposed siting zone for elements up to 6m (BESS)
- Proposed siting zone for elements up to 6m (Satellite Collector Compound)
- Proposed siting zone for elements up to 12m
- Proposed siting zone for Grid Connection Corridor

NOTES:

1. The location of features shown are indicative only. Exact locations to be confirmed on site.
2. Additional features may be present on site that have not been identified on the topographical plan.
3. Parameter plan drawings are based on OS MasterMap information.
4. Development up to 3m, 3.5m and 4m high would typically comprise Solar PV modules.
5. Siting zone for elements up to 6m high may include Satellite Collector Compounds or BESS located within this zone.
6. Siting zone for elements up to 12m high may include Springwell Substation, Main Collector Compound and BESS located within this zone.
7. The following components are not shown on the parameter plan drawings: cable route corridors, boundary fencing and CCTV, inverter and transformers and switchgear compounds, internal access tracks, drainage, construction access and compounds.

App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

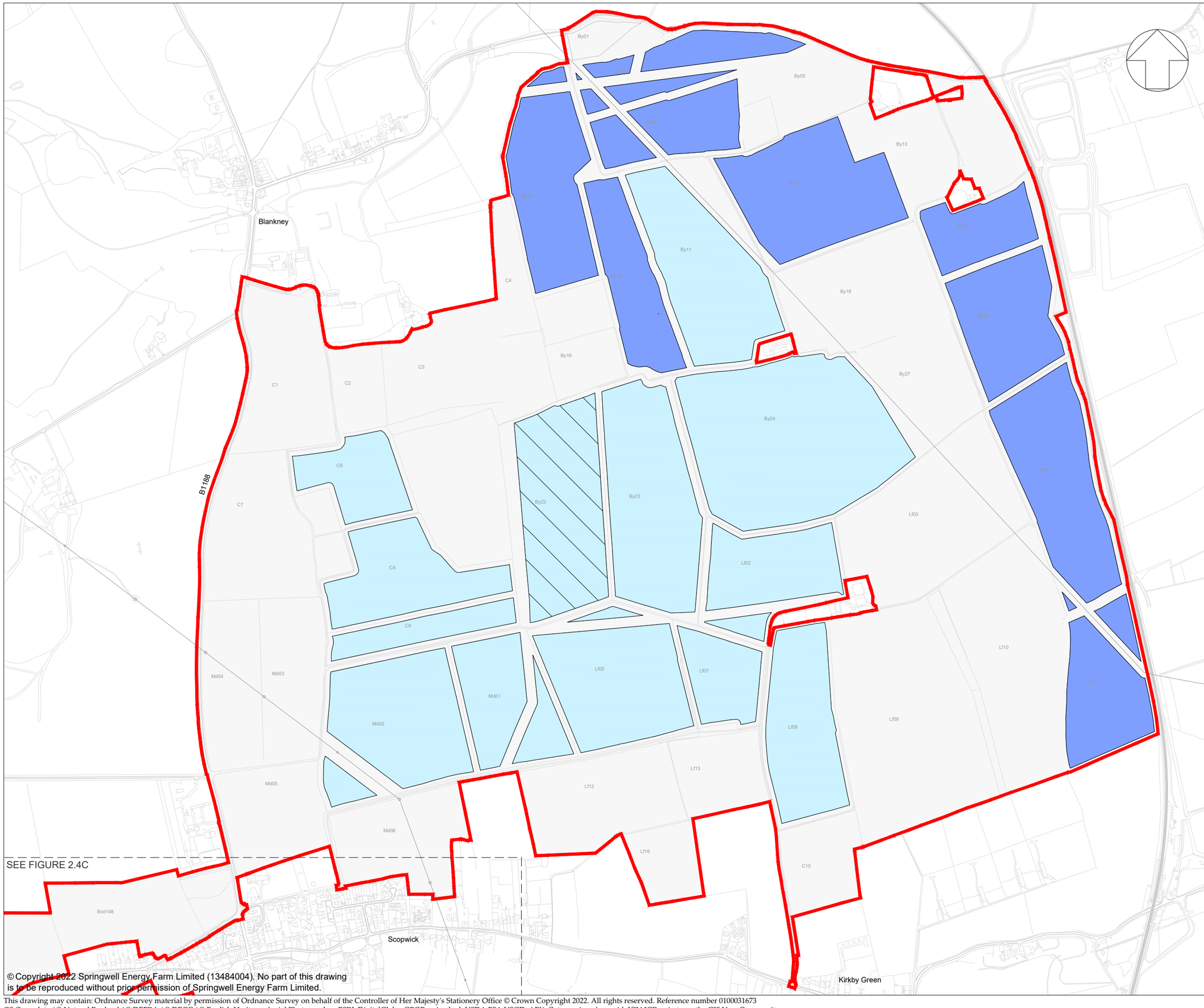
TITLE:
INDICATIVE HEIGHT PARAMETERS
KEY PLAN

FIGURE NUMBER:
2.4A

SCALE : 1:40,000 @ A3

0 2.5km

REV:
P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

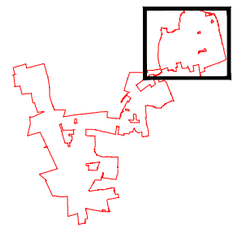
Indicative maximum height above ground level (meters)

- Proposed development up to 3m
- Proposed development up to 3.5m
- Proposed development up to 4m
- Proposed siting zone for elements up to 6m (BESS)
- Proposed siting zone for elements up to 6m (Satellite Collector Compound)
- Proposed siting zone for elements up to 12m
- Proposed siting zone for Grid Connection Corridor

NOTES:

1. Refer to Figure 2.4A for drawing notes.

KEY PLAN:



01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

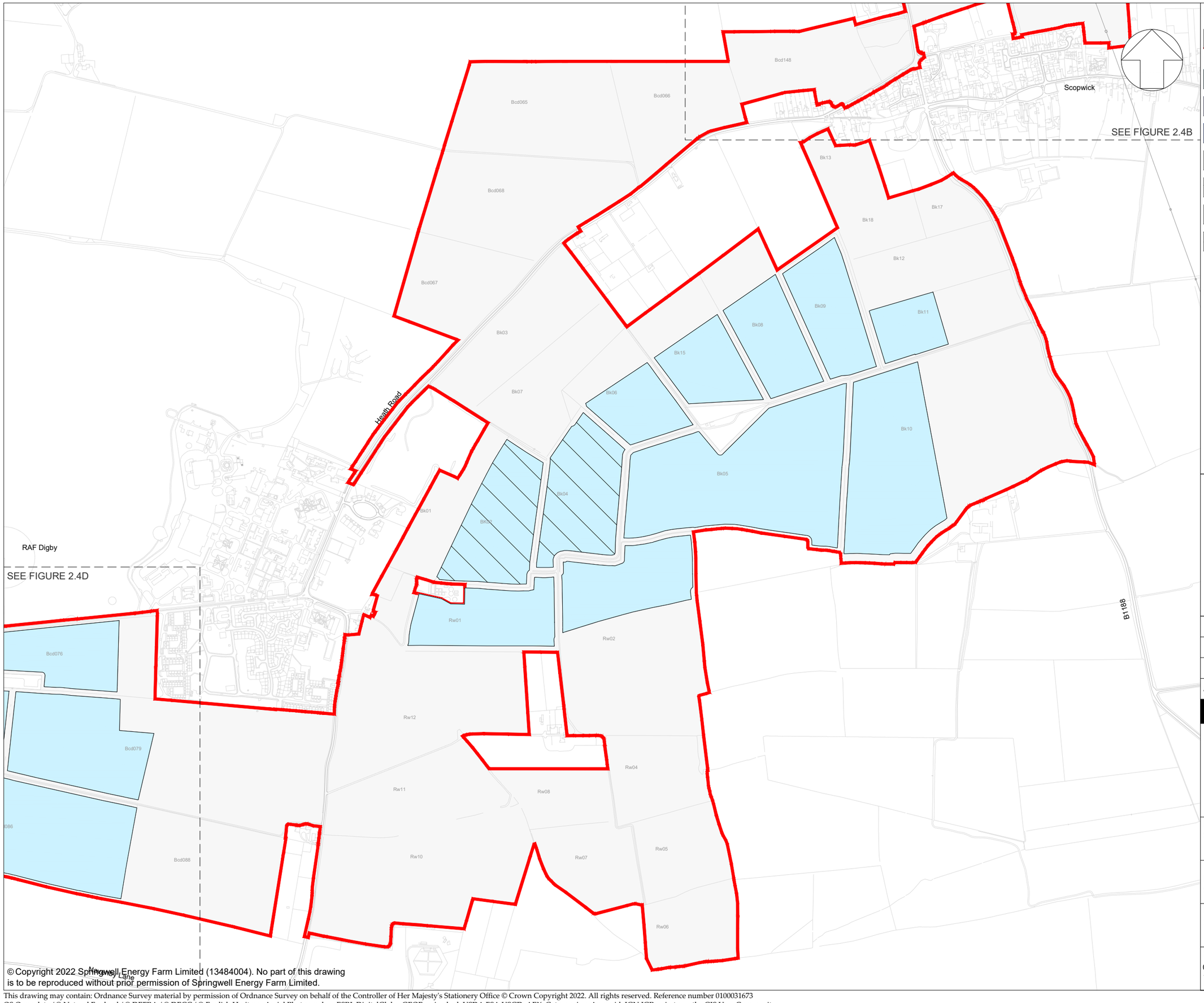
TITLE:
INDICATIVE HEIGHT PARAMETERS
SPRINGWELL EAST

FIGURE NUMBER:
2.4B

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

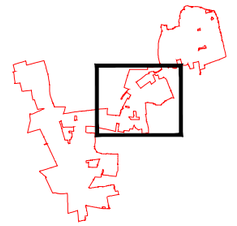
Indicative maximum height above ground level (meters)

- Proposed development up to 3m
- Proposed development up to 3.5m
- Proposed development up to 4m
- Proposed siting zone for elements up to 6m (BESS)
- Proposed siting zone for elements up to 6m (Satellite Collector Compound)
- Proposed siting zone for elements up to 12m
- Proposed siting zone for Grid Connection Corridor

NOTES:

1. Refer to Figure 2.4A for drawing notes.

KEY PLAN:



App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

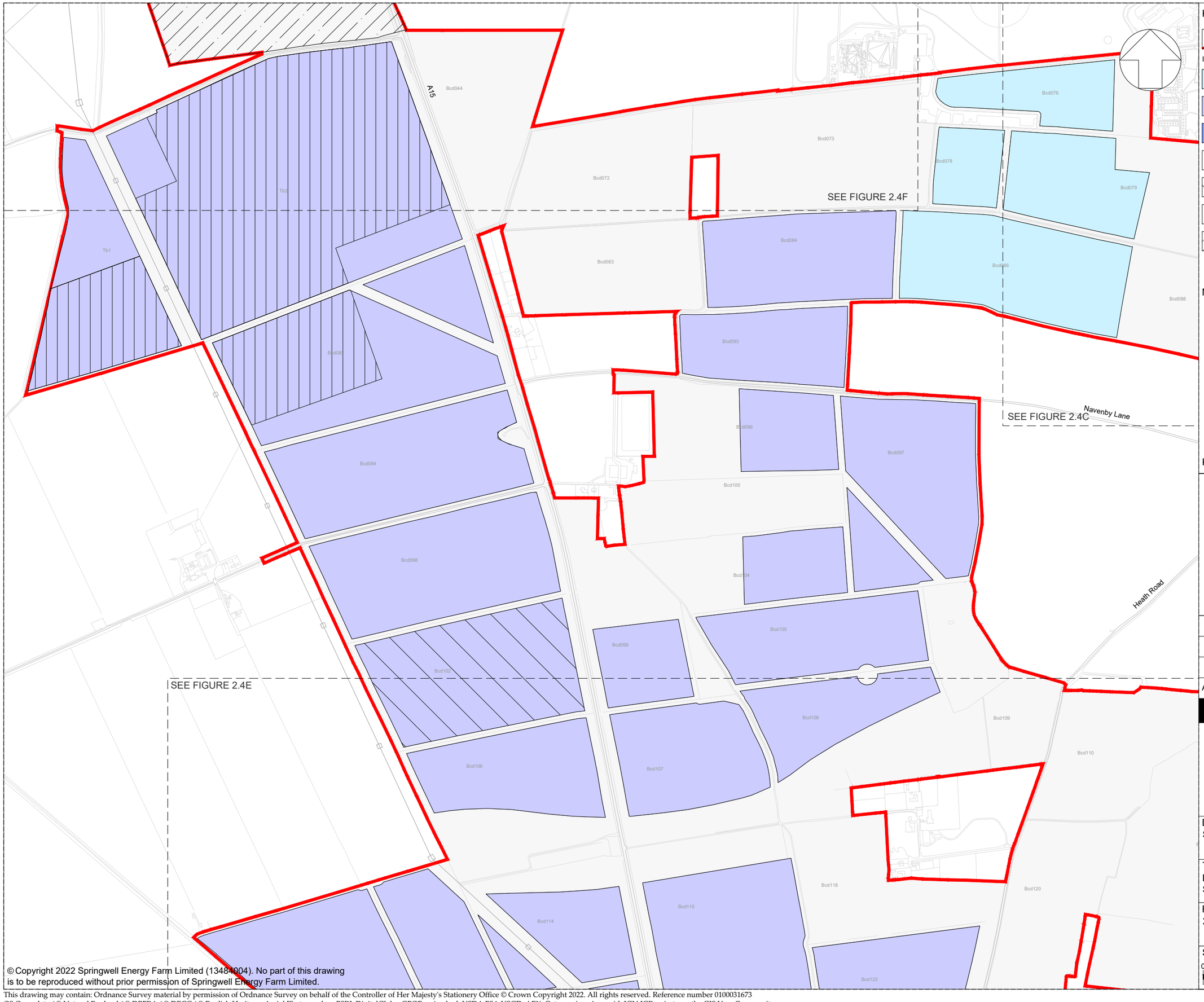
TITLE:
INDICATIVE HEIGHT PARAMETERS
SPRINGWELL CENTRAL

FIGURE NUMBER:
2.4C

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Indicative maximum height above ground level (meters)

- Proposed development up to 3m
- Proposed development up to 3.5m
- Proposed development up to 4m
- Proposed siting zone for elements up to 6m (BESS)
- Proposed siting zone for elements up to 6m (Satellite Collector Compound)
- Proposed siting zone for elements up to 12m
- Proposed siting zone for Grid Connection Corridor

NOTES:

1. Refer to Figure 2.4A for drawing notes.

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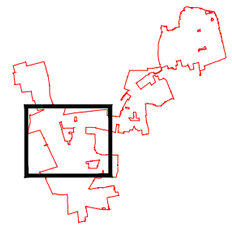


01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

TITLE:
INDICATIVE HEIGHT PARAMETERS
SPRINGWELL WEST A

FIGURE NUMBER:
2.4D

SCALE : 1:10,000 @ A3

0 500m

REV: P01

SEE FIGURE 2.4D

Bcd106
Bcd107
Bcd108
Bcd109
Bcd110
Bcd111
Bcd114
Bcd115
Bcd118
Bcd120
Bcd123
Bcd127
Bcd128
Bcd129
Bcd138
Bcd139
Bcd140
Bcd141
Tb3
Tb4
Tb5
W1
W2
E1
E2
E1a
A15
Brauncewell Village

KEY:

- Indicative Site Boundary (Preferred Order Limits)

Indicative maximum height above ground level (meters)

- Proposed development up to 3m
- Proposed development up to 3.5m
- Proposed development up to 4m
- Proposed siting zone for elements up to 6m (BESS)
- Proposed siting zone for elements up to 6m (Satellite Collector Compound)
- Proposed siting zone for elements up to 12m
- Proposed siting zone for Grid Connection Corridor

NOTES:

1. Refer to Figure 2.4A for drawing notes.

KEY PLAN:

01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

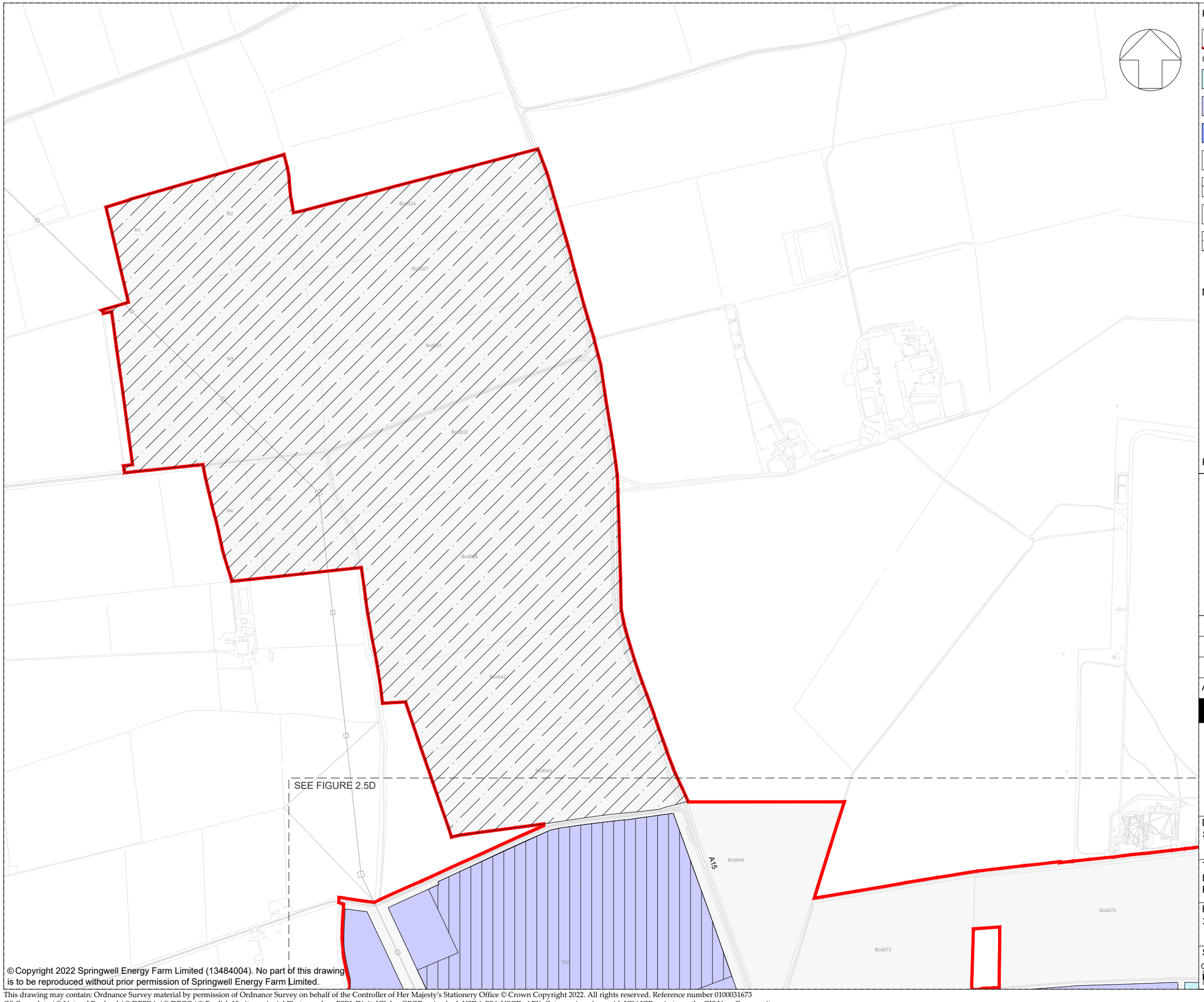
DOCUMENT:
SPRINGWELL SOLAR FARM

TITLE:
INDICATIVE HEIGHT PARAMETERS
SPRINGWELL WEST B

FIGURE NUMBER:
2.4E

SCALE : 1:10,000 @ A3
0 500m

REV:
P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

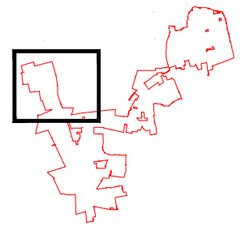
Indicative maximum height above ground level (meters)

- Proposed development up to 3m
- Proposed development up to 3.5m
- Proposed development up to 4m
- Proposed siting zone for elements up to 6m (BESS)
- Proposed siting zone for elements up to 6m (Satellite Collector Compound)
- Proposed siting zone for elements up to 12m
- Proposed siting zone for Grid Connection Corridor

NOTES:

1. Refer to Figure 2.5A for drawing notes.

KEY PLAN:



01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

TITLE:
INDICATIVE GREEN INFRASTRUCTURE PARAMETERS SPRINGWELL WEST C

FIGURE NUMBER:
2.5F

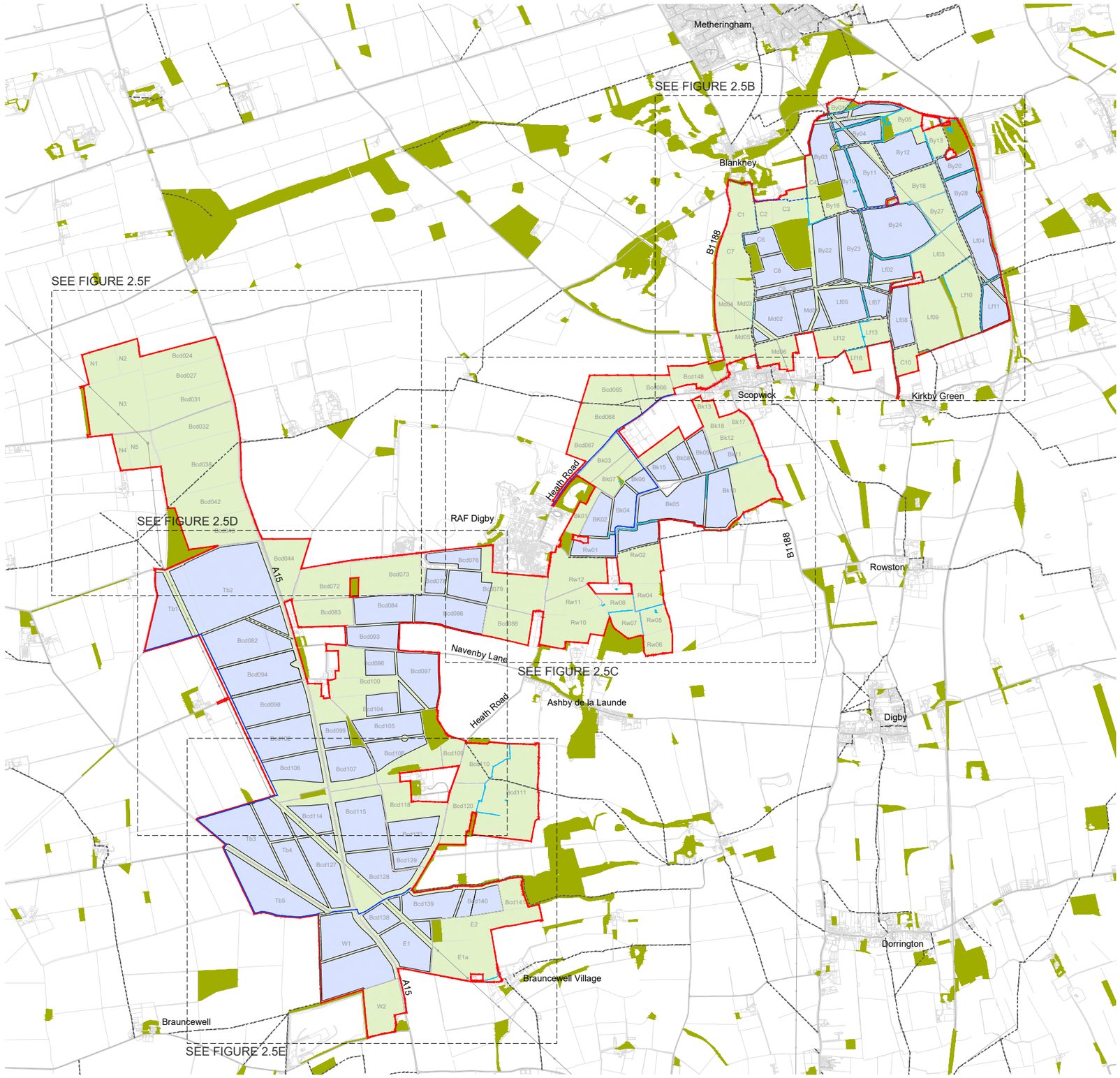
SCALE : 1:10,000 @ A3

0 500m

REV: P01

Figure 2.5

Indicative Green Infrastructure Parameters Plan



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing landscape features

- Existing woodland
- Existing watercourse

Indicative proposed green infrastructure

- Indicative area for mitigation, enhancement and/or retained agricultural land

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

Indicative proposed routes

- Proposed permissive footpath

NOTES:

1. The location of features shown are indicative only. Exact locations to be confirmed on site.
2. Additional features may be present on site that have not been identified on the topographical plan.
3. Parameter plan drawings are based on OS MasterMap information.

App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

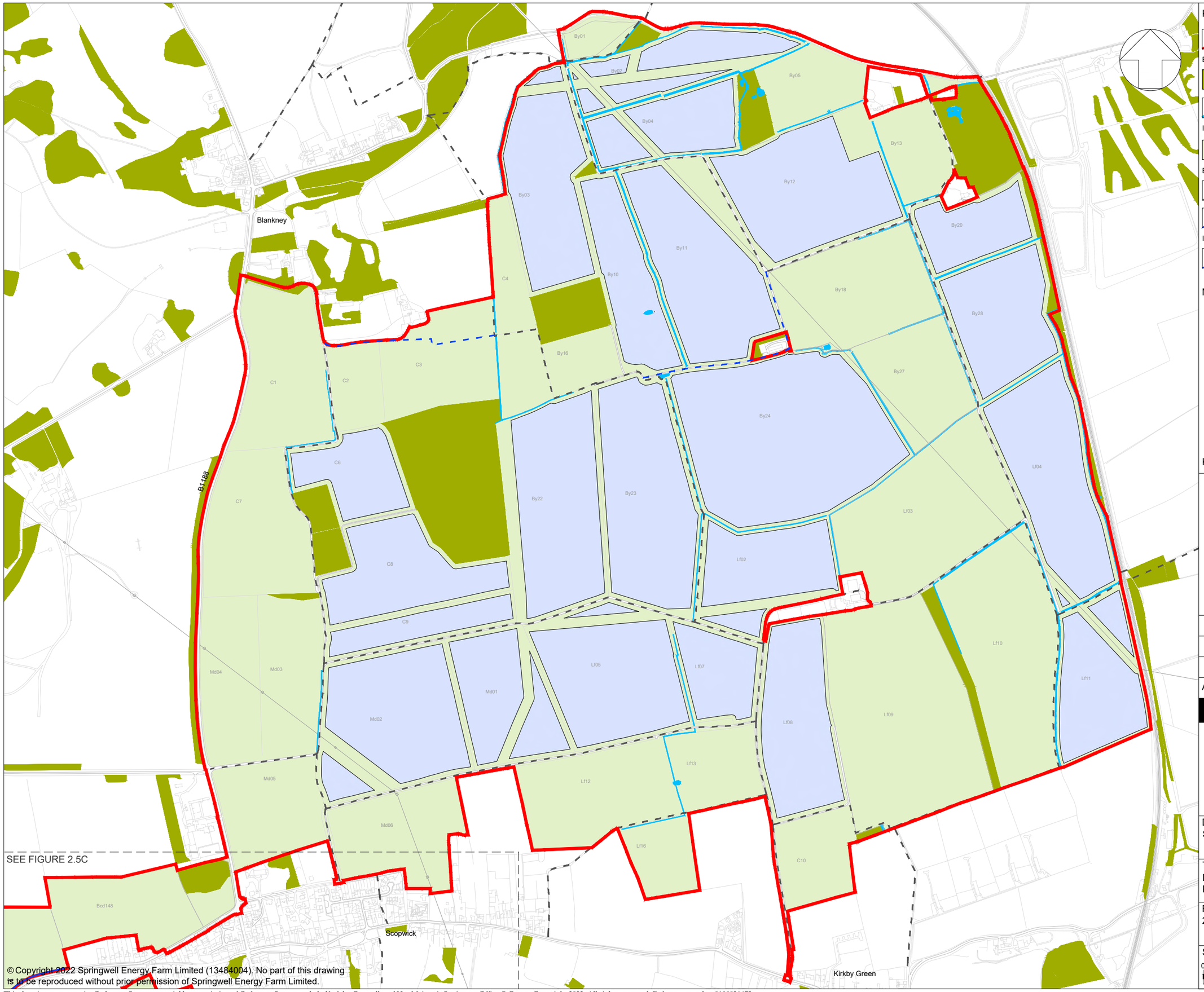
TITLE:
INDICATIVE GREEN INFRASTRUCTURE PARAMETERS KEY PLAN

FIGURE NUMBER:
2.5A

SCALE : 1:40,000 @ A3

0 2.5km

REV: P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing landscape features

- Existing woodland
- Existing watercourse

Indicative proposed green infrastructure

- Indicative area for mitigation, enhancement and/or retained agricultural land

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

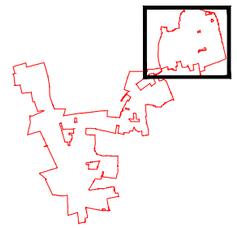
Indicative proposed routes

- Proposed permissive footpath

NOTES:

1. Refer to Figure 2.5A for drawing notes.

KEY PLAN:



App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SRINGWELL SOLAR FARM

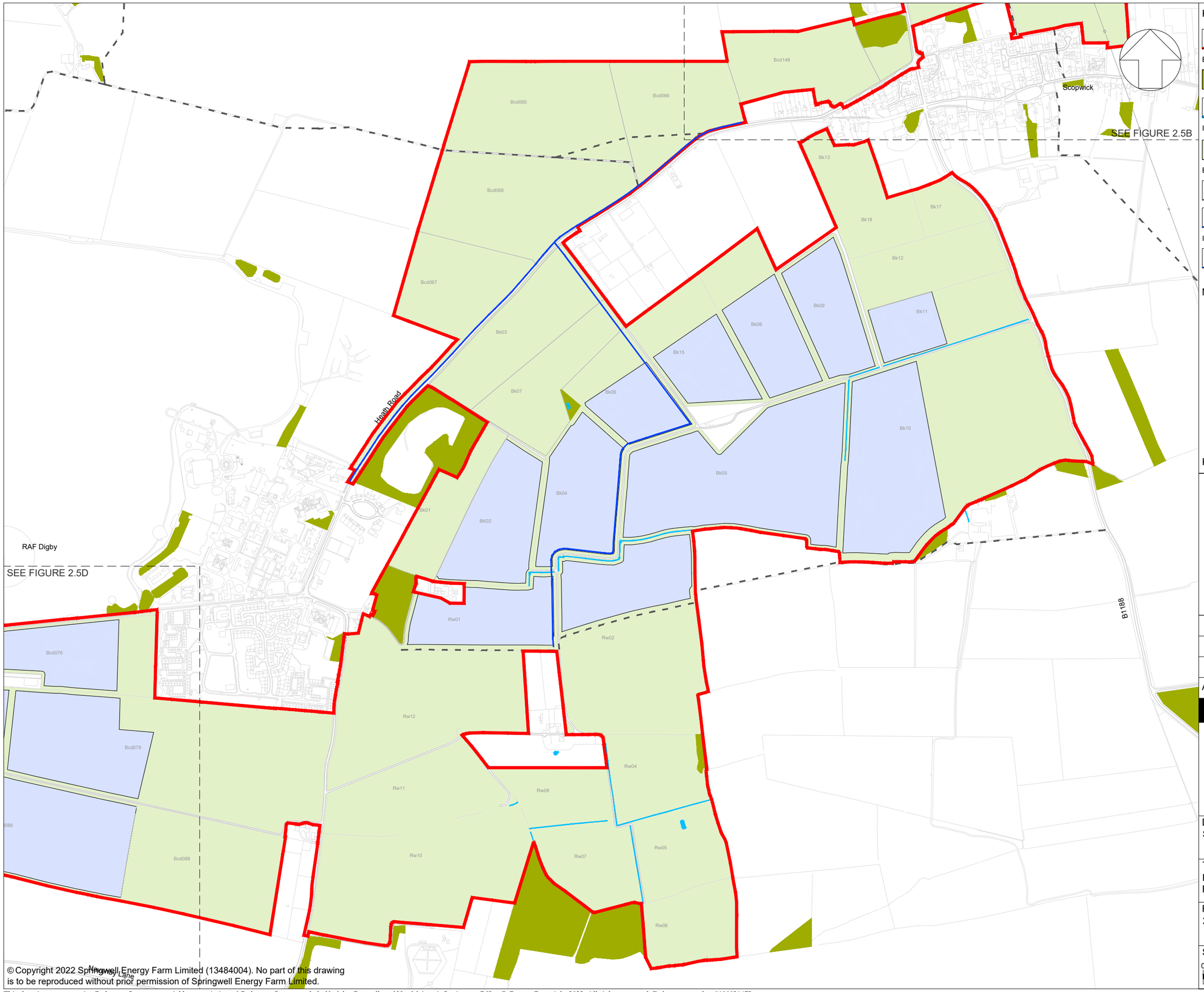
TITLE:
INDICATIVE GREEN INFRASTRUCTURE PARAMETERS SPRINGWELL EAST

FIGURE NUMBER:
2.5B

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing landscape features

- Existing woodland
- Existing watercourse

Indicative proposed green infrastructure

- Indicative area for mitigation, enhancement and/or retained agricultural land

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

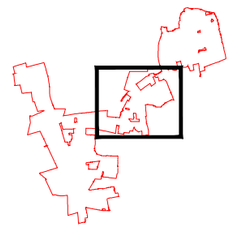
Indicative proposed routes

- Proposed permissive footpath

NOTES:

1. Refer to Figure 2.5A for drawing notes.

KEY PLAN:



01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

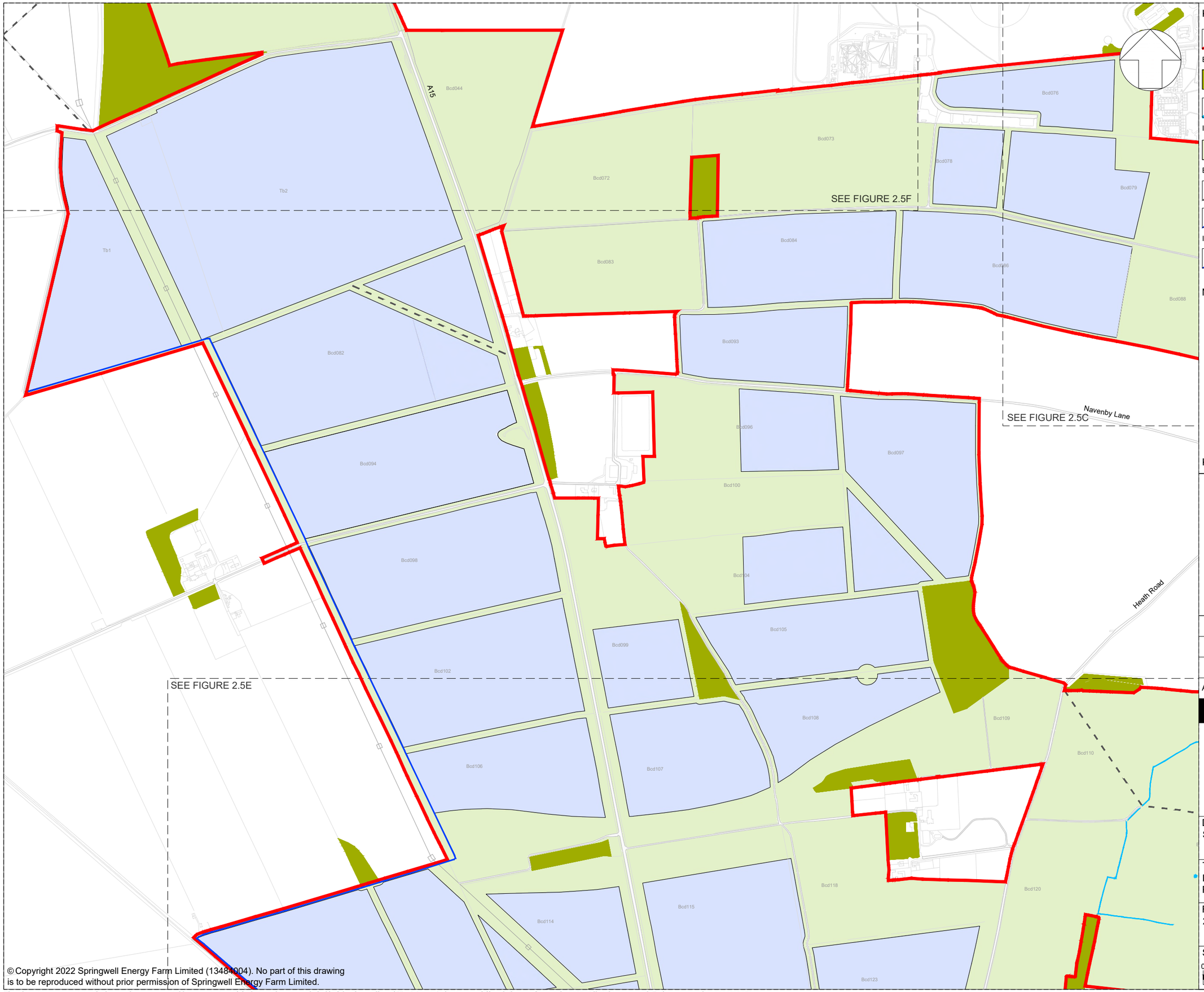
TITLE:
INDICATIVE GREEN INFRASTRUCTURE PARAMETERS SPRINGWELL CENTRAL

FIGURE NUMBER:
2.5C

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing landscape features

- Existing woodland
- Existing watercourse

Indicative proposed green infrastructure

- Indicative area for mitigation, enhancement and/or retained agricultural land

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

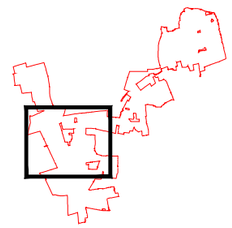
Indicative proposed routes

- Proposed permissive footpath

NOTES:

1. Refer to Figure 2.5A for drawing notes.

KEY PLAN:



01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

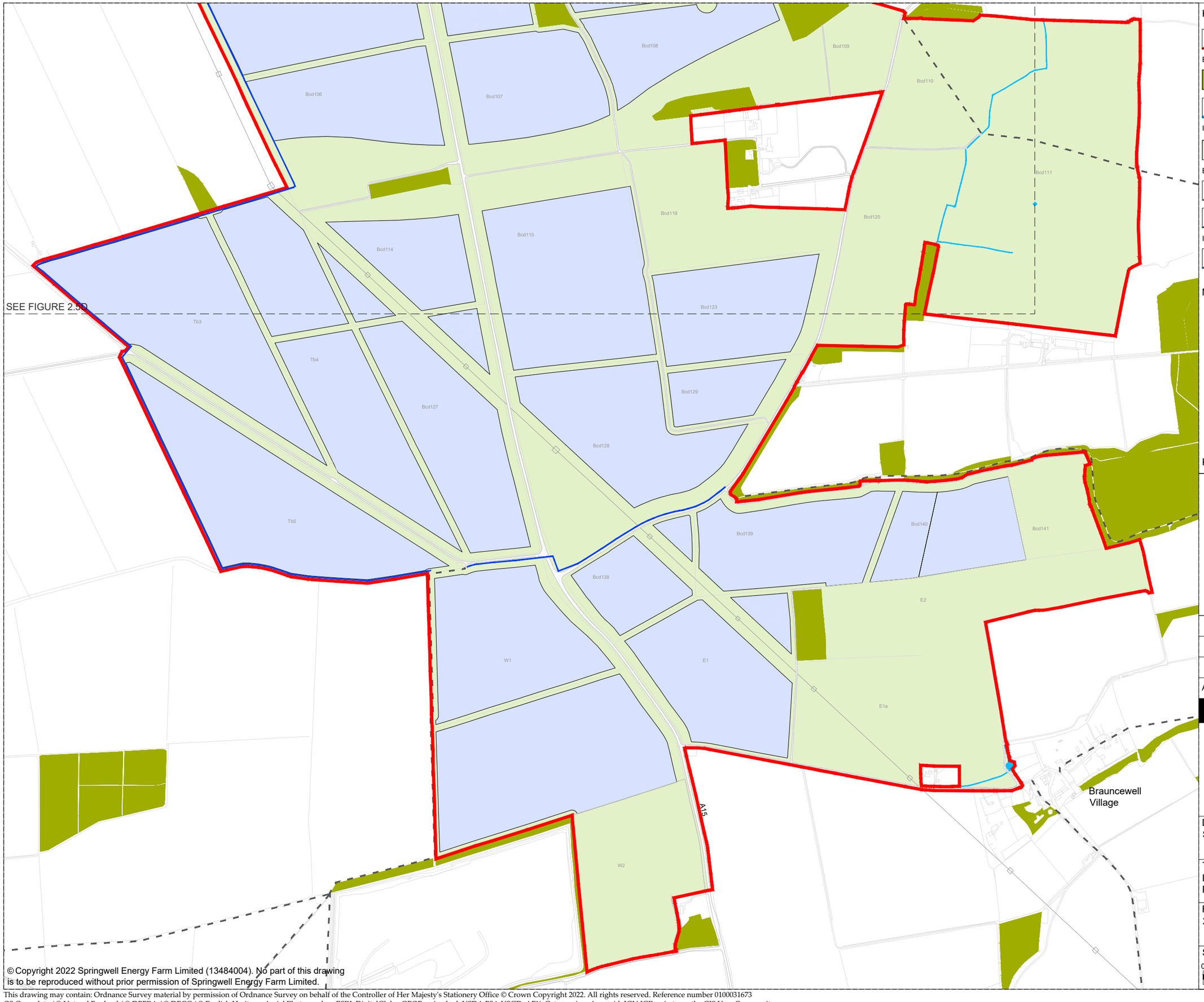
TITLE:
INDICATIVE GREEN INFRASTRUCTURE PARAMETERS SPRINGWELL WEST A

FIGURE NUMBER:
2.5D

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing landscape features

- Existing woodland
- Existing watercourse

Indicative proposed green infrastructure

- Indicative area for mitigation, enhancement and/or retained agricultural land

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

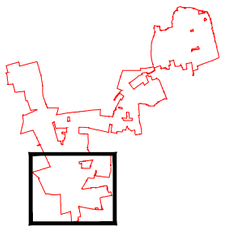
Indicative proposed routes

- Proposed permissive footpath

NOTES:

1. Refer to Figure 2.5A for drawing notes.

KEY PLAN:



01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

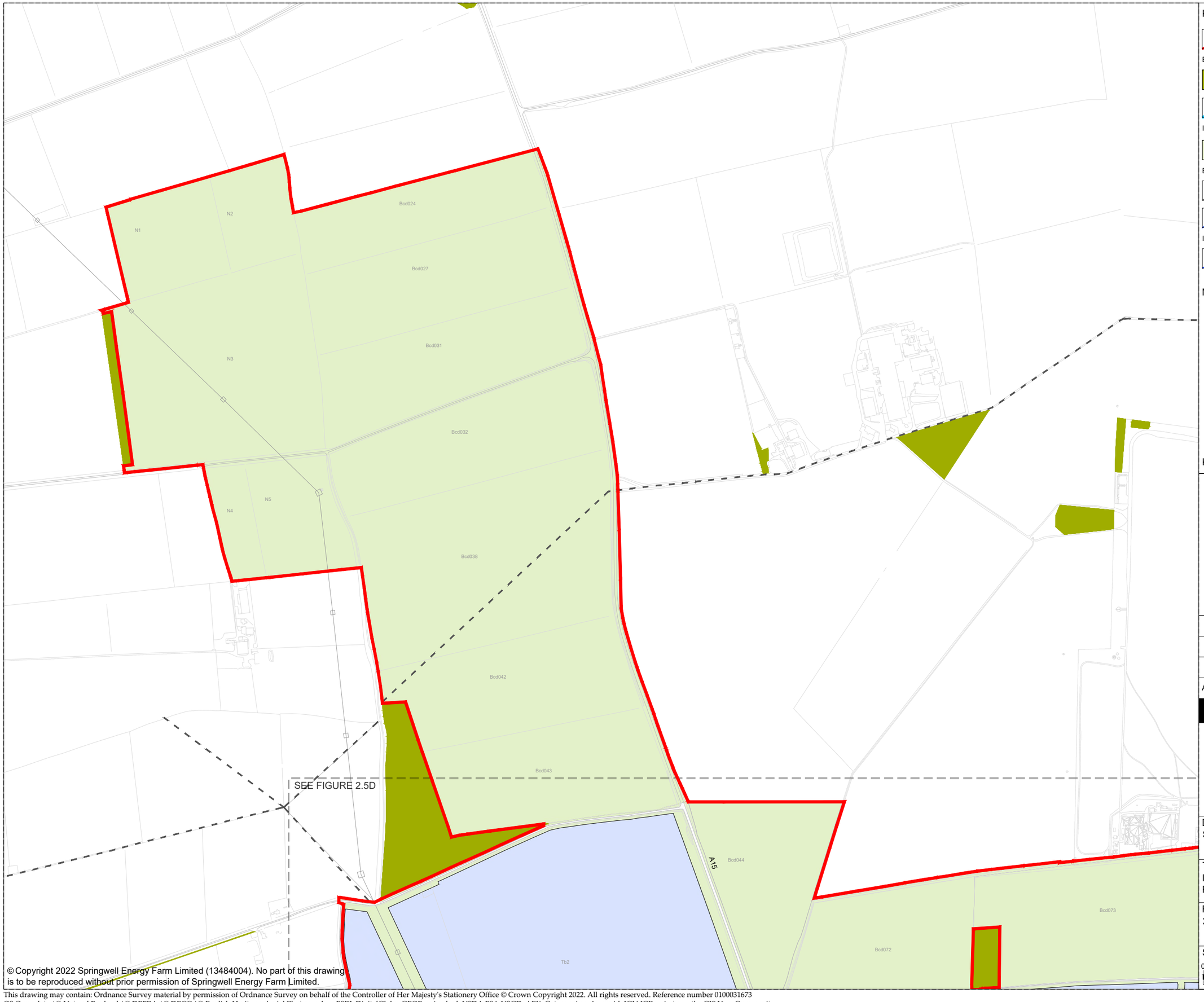
TITLE:
INDICATIVE GREEN INFRASTRUCTURE PARAMETERS SPRINGWELL WEST B

FIGURE NUMBER:
2.5E

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

Indicative Site Boundary (Preferred Order Limits)

Existing landscape features

Existing woodland

Existing watercourse

Indicative proposed green infrastructure

Indicative area for mitigation, enhancement and/or retained agricultural land

Existing routes

Existing Public Right of Way

Existing permissive footpath

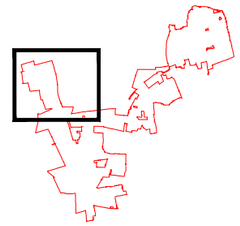
Indicative proposed routes

Proposed permissive footpath

NOTES:

1. Refer to Figure 2.5A for drawing notes.

KEY PLAN:



01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

TITLE:
INDICATIVE GREEN INFRASTRUCTURE PARAMETERS SPRINGWELL WEST C

FIGURE NUMBER:
2.5F

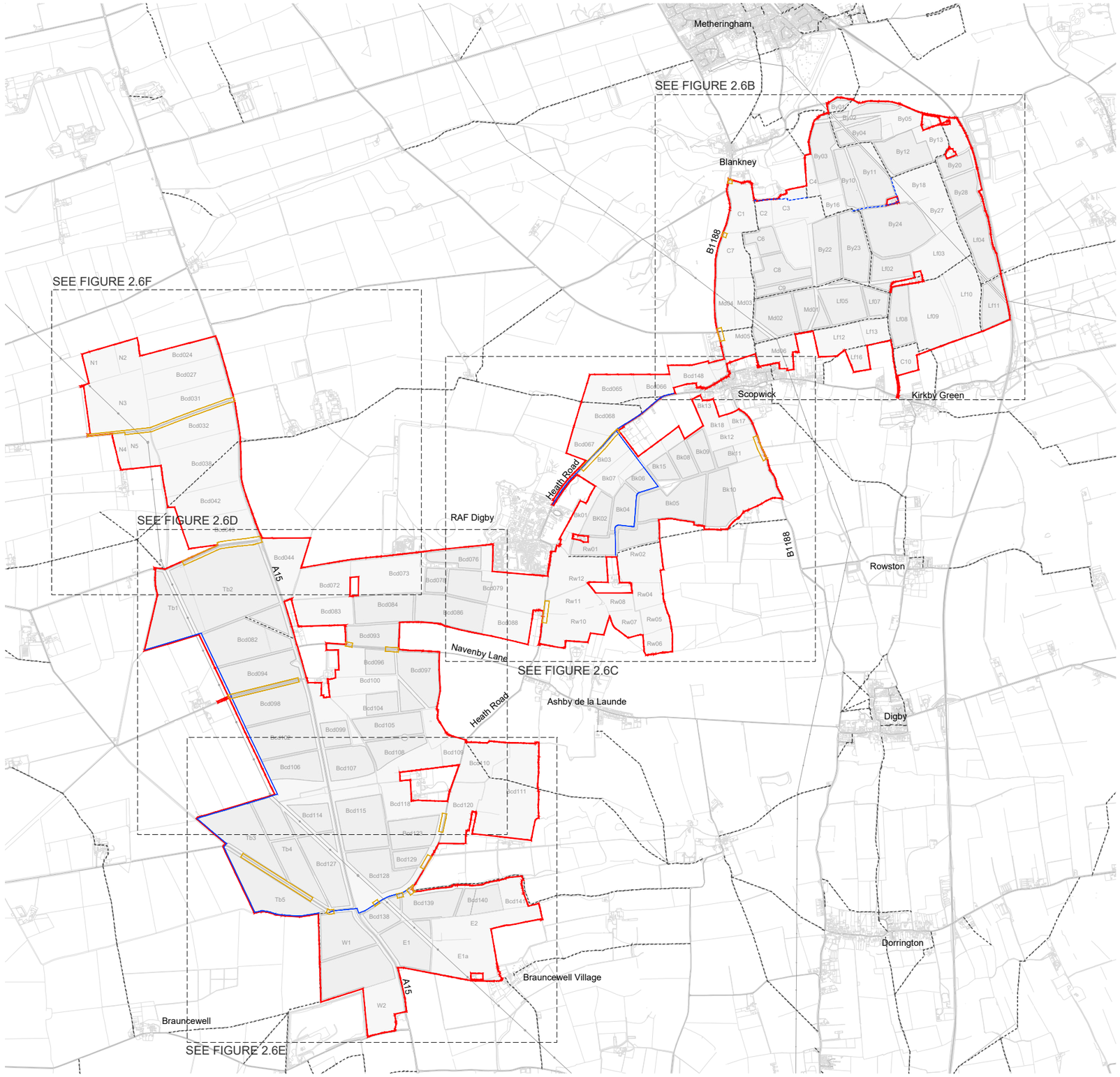
SCALE : 1:10,000 @ A3

0 500m

REV: P01

Figure 2.6

Indicative Operational Access and Movement Parameters Plan



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

Indicative proposed operational access

- Proposed site access
- Proposed permissive footpath

NOTES:

1. The location of features shown are indicative only. Exact locations to be confirmed on site.
2. Additional features may be present on site that have not been identified on the topographical plan.
3. Parameter plan drawings are based on OS MasterMap information.

App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

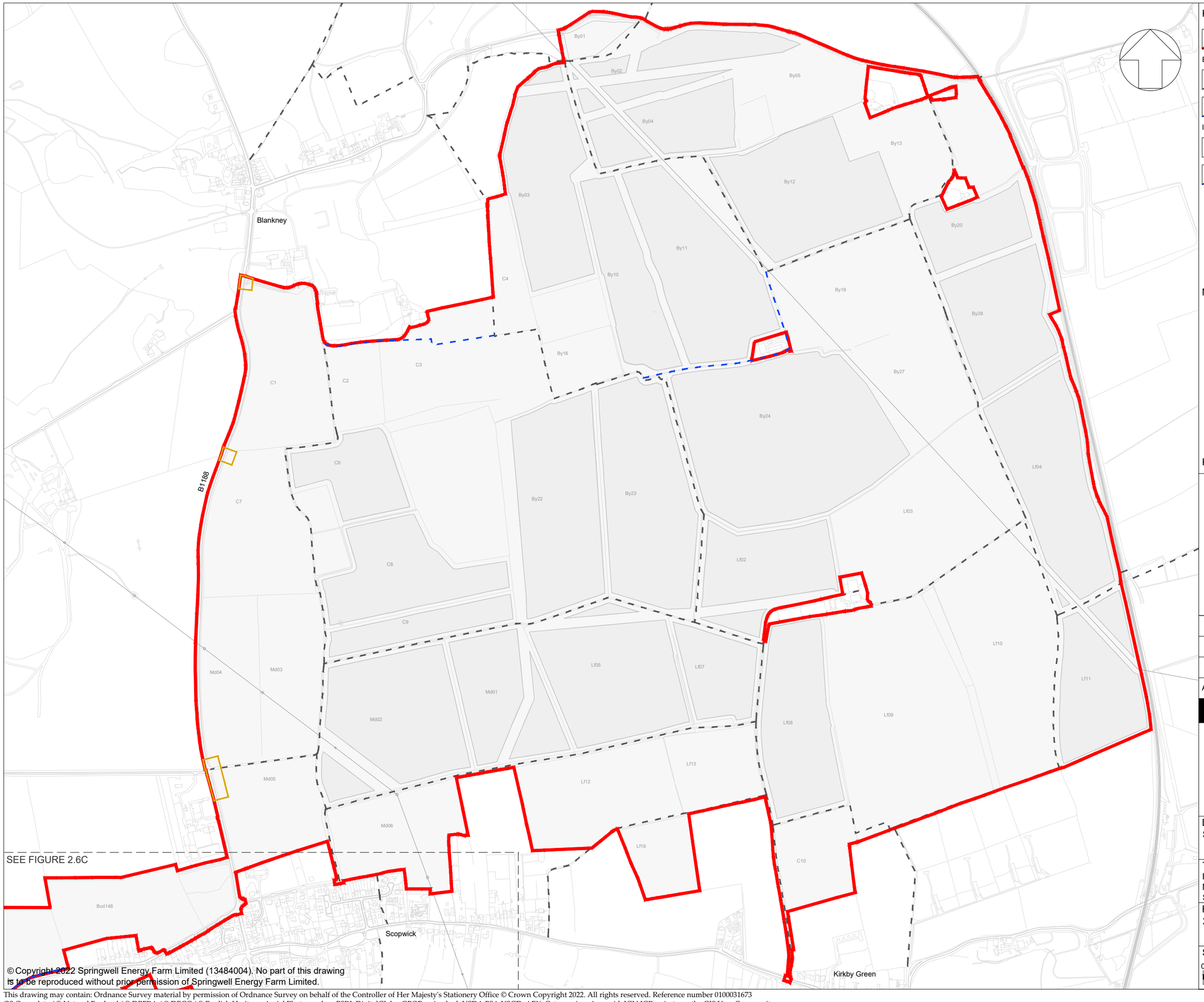
TITLE:
INDICATIVE OPERATIONAL ACCESS & MOVEMENT PARAMETERS KEY PLAN

FIGURE NUMBER:
2.6A

SCALE : 1:40,000 @ A3

0 2.5km

REV: P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

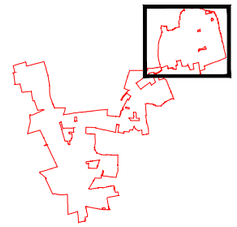
Indicative proposed operational access

- Proposed site access location
- Proposed permissive footpath

NOTES:

1. Refer to Figure 2.6A for drawing notes.

KEY PLAN:



App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

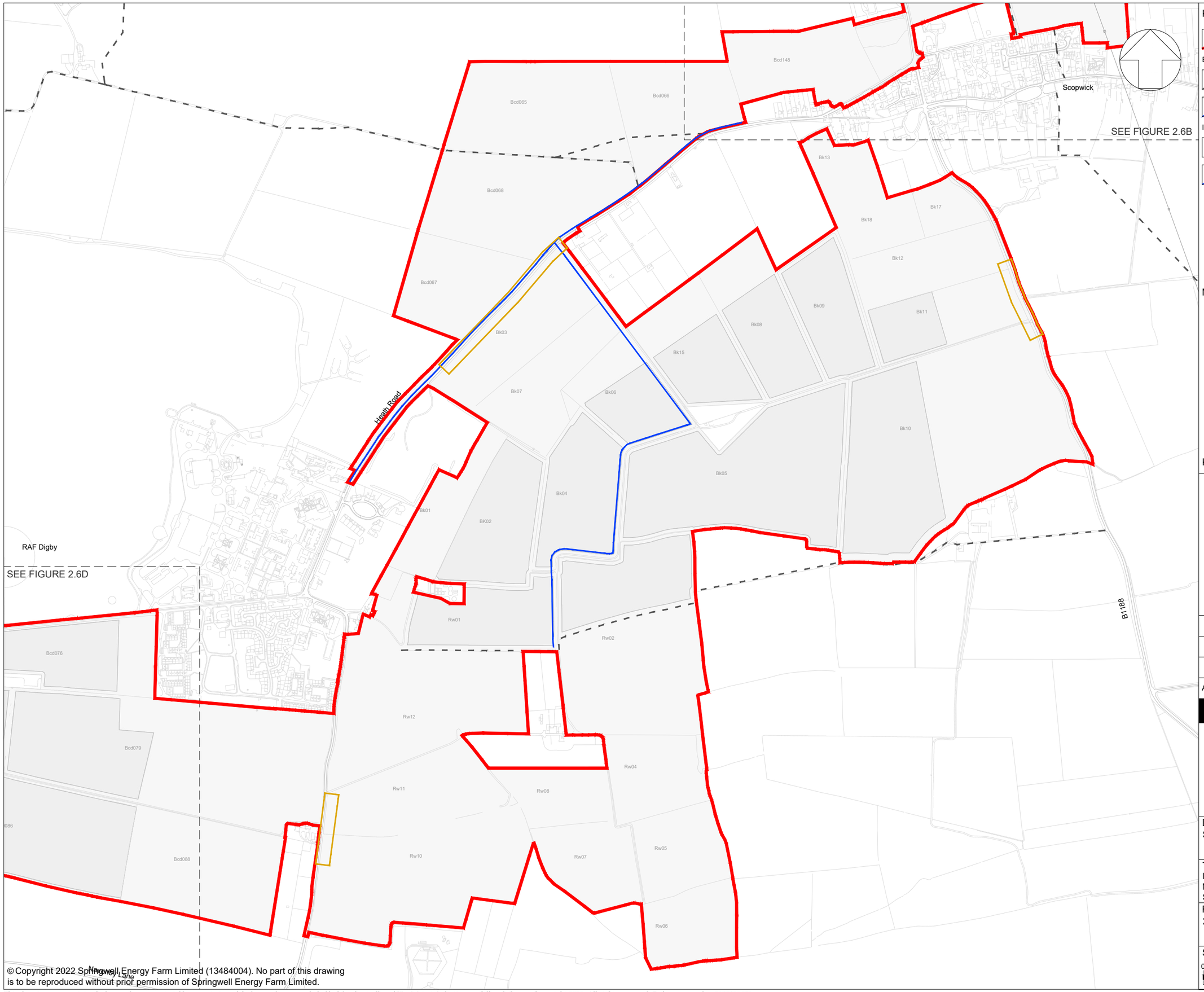
TITLE:
INDICATIVE OPERATIONAL ACCESS & MOVEMENT PARAMETERS
SPRINGWELL EAST

FIGURE NUMBER:
2.6B

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

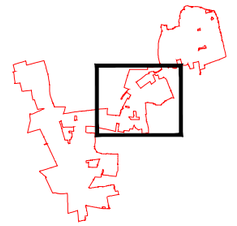
Indicative proposed operational access

- Proposed site access location
- Proposed permissive footpath

NOTES:

1. Refer to Figure 2.6A for drawing notes.

KEY PLAN:



App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

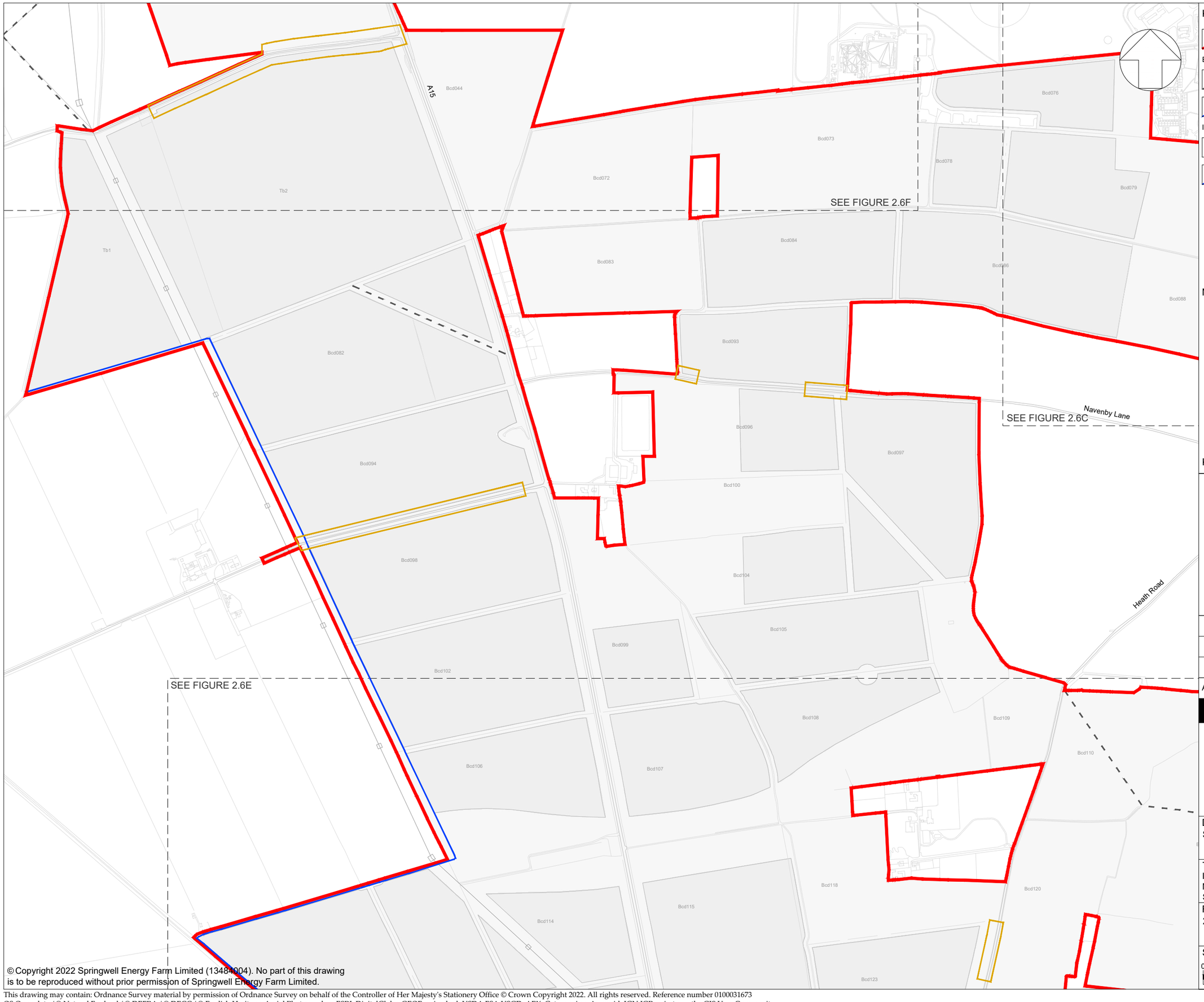
TITLE:
INDICATIVE OPERATIONAL ACCESS & MOVEMENT PARAMETERS SPRINGWELL CENTRAL

FIGURE NUMBER:
2.6C

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

Indicative Site Boundary (Preferred Order Limits)

Existing routes

Existing Public Right of Way

Existing permissive footpath

Indicative proposed operational access

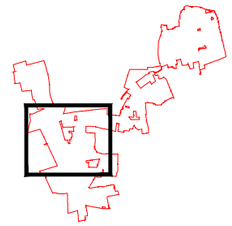
Proposed site access location

Proposed permissive footpath

NOTES:

1. Refer to Figure 2.6A for drawing notes.

KEY PLAN:



01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

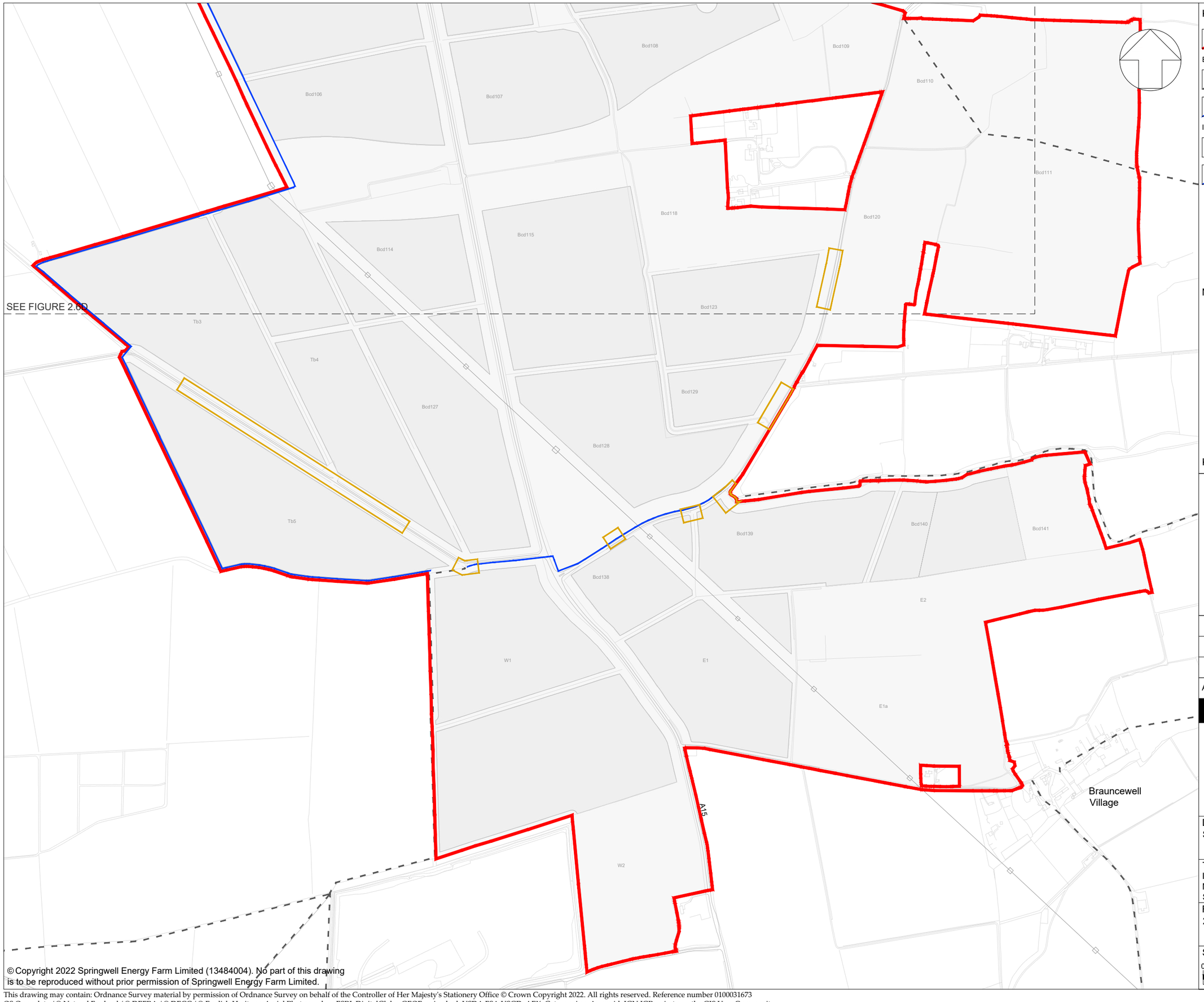
TITLE:
INDICATIVE OPERATIONAL ACCESS & MOVEMENT PARAMETERS
SPRINGWELL WEST A

FIGURE NUMBER:
2.6D

SCALE : 1:10,000 @ A3

0 500m

REV:
P01



KEY:

- Indicative Site Boundary (Preferred Order Limits)

Existing routes

- Existing Public Right of Way
- Existing permissive footpath

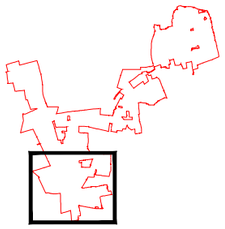
Indicative proposed operational access

- Proposed site access location
- Proposed permissive footpath

NOTES:

1. Refer to Figure 2.6A for drawing notes.

KEY PLAN:



App	Date	Description	Drn	Chk	App
01	06/11/2023	First Draft	LDA	AA	AA

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

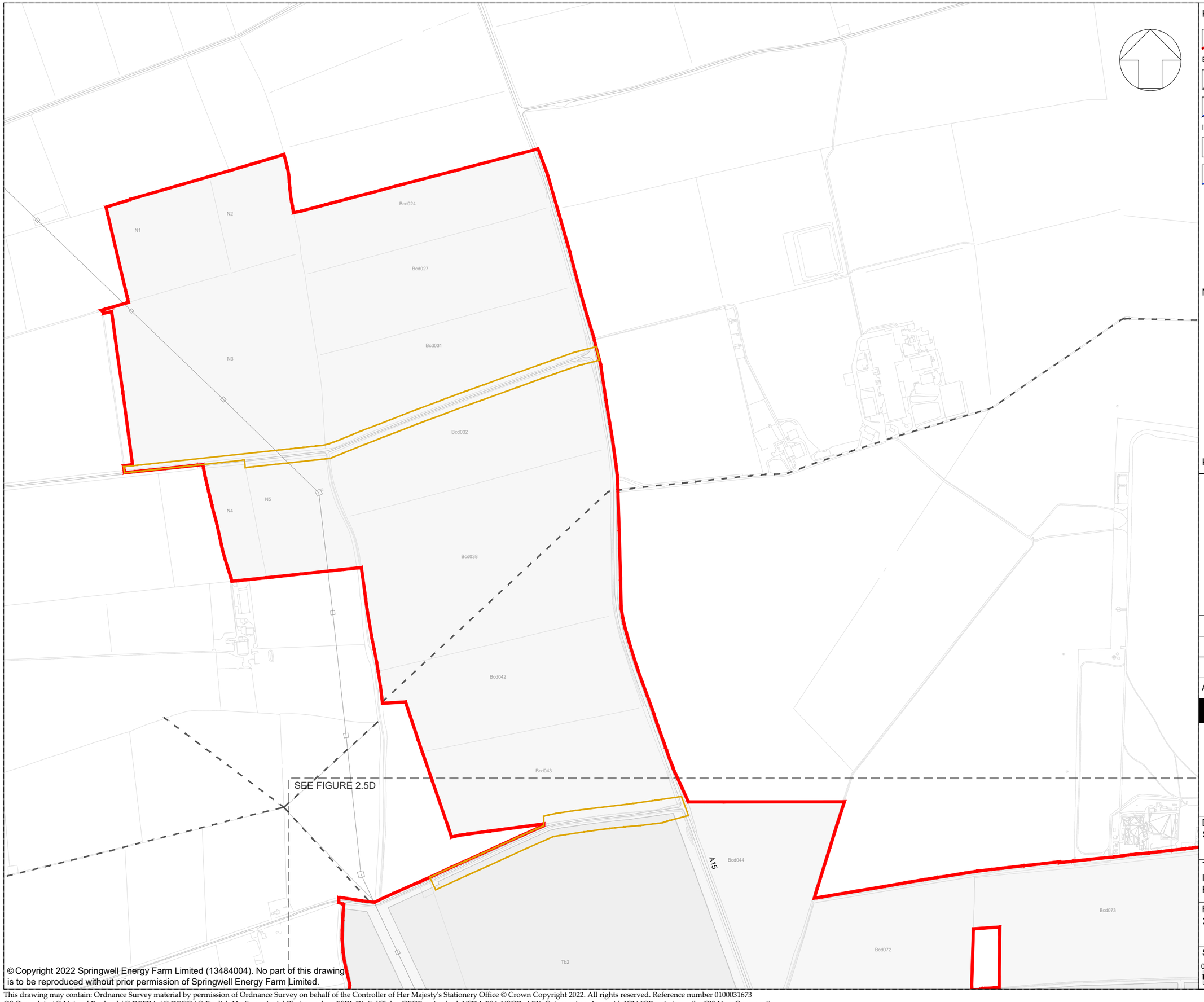
TITLE:
INDICATIVE OPERATIONAL ACCESS & MOVEMENT PARAMETERS
SPRINGWELL WEST B

FIGURE NUMBER:
2.6E

SCALE : 1:10,000 @ A3

0 500m

REV: P01



KEY:

Indicative Site Boundary (Preferred Order Limits)

Existing routes

Existing Public Right of Way

Existing permissive footpath

Indicative proposed operational access

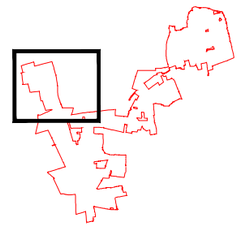
Proposed site access location

Proposed permissive footpath

NOTES:

1. Refer to Figure 2.5A for drawing notes.

KEY PLAN:



01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

TITLE:
INDICATIVE GREEN INFRASTRUCTURE PARAMETERS SPRINGWELL WEST C

FIGURE NUMBER:
2.5F

SCALE : 1:10,000 @ A3

0 500m

REV: P01

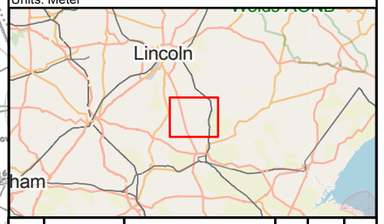
Figure 2.7
Indicative Cable Routes

LEGEND:

- Site Boundary
- Siting Zone for the Grid Connection Corridor
- Indicative cable route connection to the Springwell Substation

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



Rev	Date	Description	Drn	Chk	App
06	22/11/2023	Updated Legend	DL	JG	DP
05	09/11/2023	Removed Cables	FA	JG	DP
04	22/11/2023	Updated Symbology	FA	JG	DP

Springwell Solar Farm

DOCUMENT:
Preliminary Environmental Information Report (PEIR)

TITLE:
Indicative Cable Routes

FIGURE NUMBER:
2.7

0 0.2 0.4
Kilometers

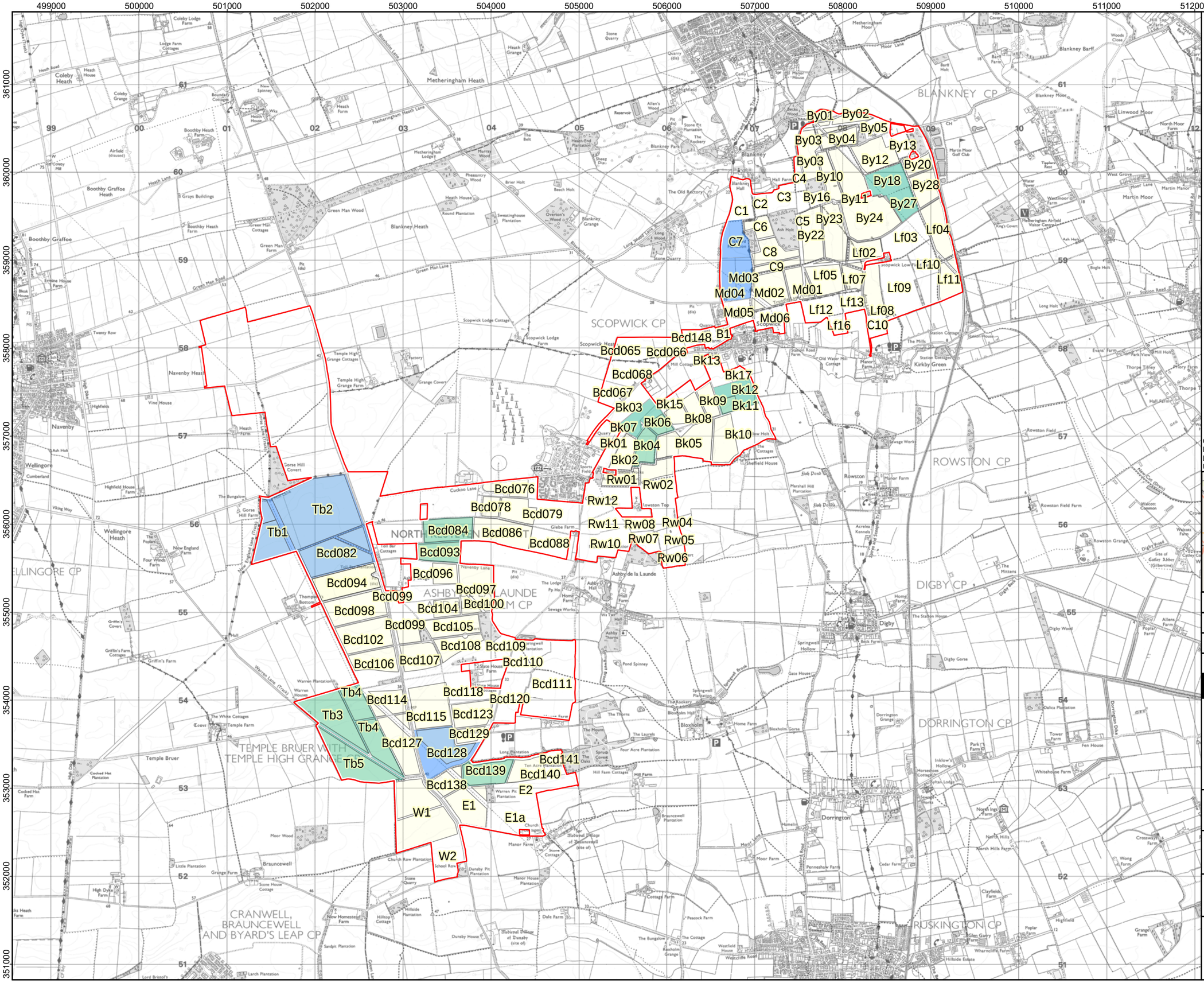
Scale: 1:35,000 @ A3

REV 06

Path: \\rsk-cloud\Projects\660000 - EPD Projects\663620 - Springwell Solar Farm\01 - GIS\P663620.aprx

Figure 2.8

Indicative Locations Suitable for the Main and Satellite Construction Compounds



LEGEND:

- Site Boundary
- Solar Fields
- Indicative locations suitable for the main construction compounds
- Indicative locations suitable for the satellite construction compounds

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
04	31/10/2023	New RLB	FA	JG	DP
03	23/08/2023	Updated Titles	FA	JG	DP
02	28/07/2023	OS Basemap	FA	JG	DP

Springwell Solar Farm

DOCUMENT:
Preliminary Environmental Information Report (PEIR)

TITLE:
Indicative locations suitable for the Main and Satellite Construction Compounds

FIGURE NUMBER:
2.8

0 0.5 1
Kilometers

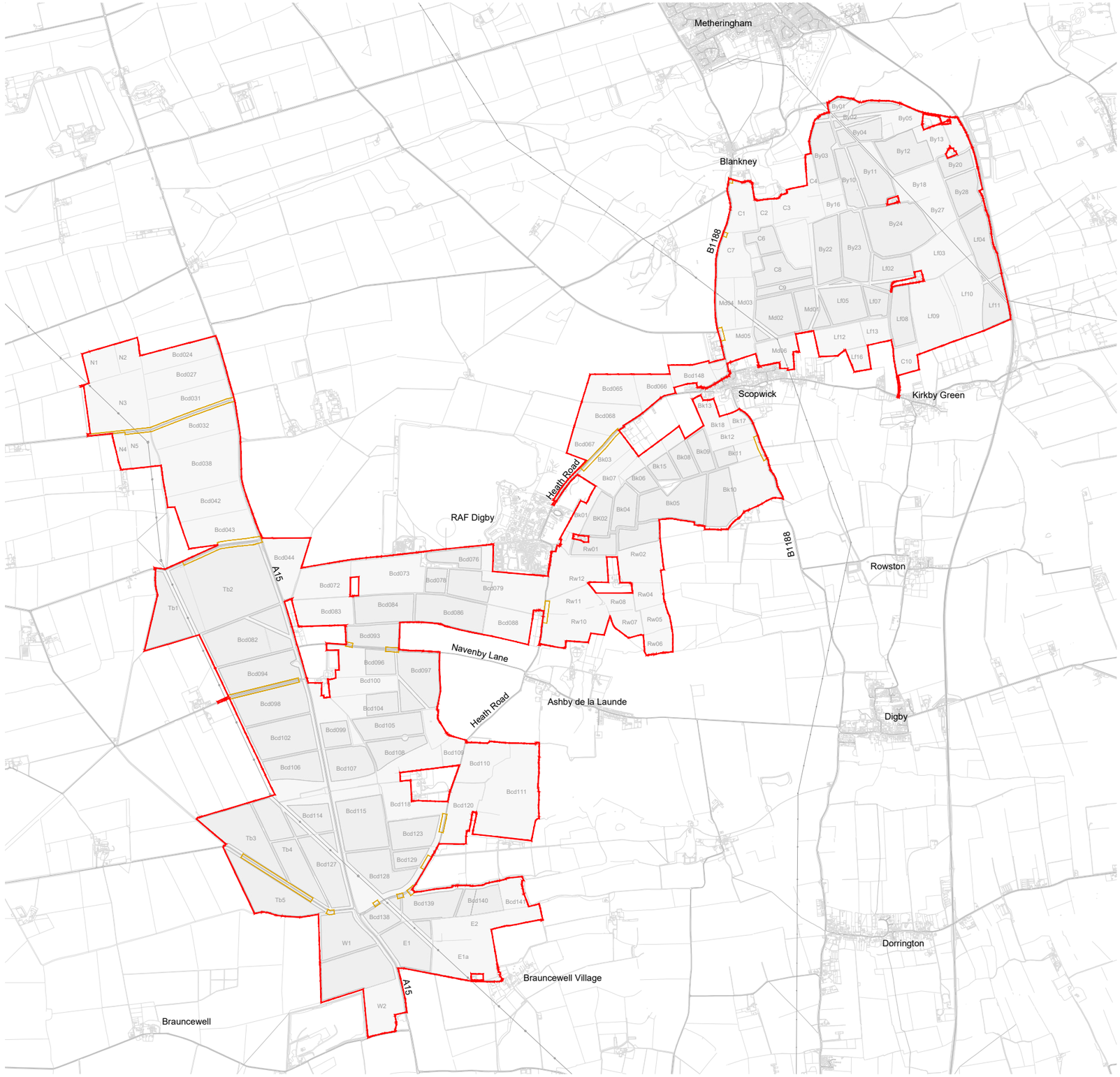
Scale: 1:40,000 @ A3

REV 04

Path: \\rsk-cloud\Projects\660000 - EPD Projects\663620 - Springwell Solar Farm\01 - GIS\P663620_masterSpringwell.aprx

Figure 2.9

Indicative Construction Accesses Parameters Plan



KEY:

Indicative Site Boundary (Preferred Order Limits)

Indicative construction access

NOTES:

1. The location of features shown are indicative only. Exact locations to be confirmed on site.
2. Additional features may be present on site that have not been identified on the topographical plan.
3. Parameter plan drawings are based on OS MasterMap information.

01	06/11/2023	First Draft	LDA	AA	AA
App	Date	Description	Drn	Chk	App

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM

TITLE:
INDICATIVE CONSTRUCTION ACCESS PARAMETERS PLAN

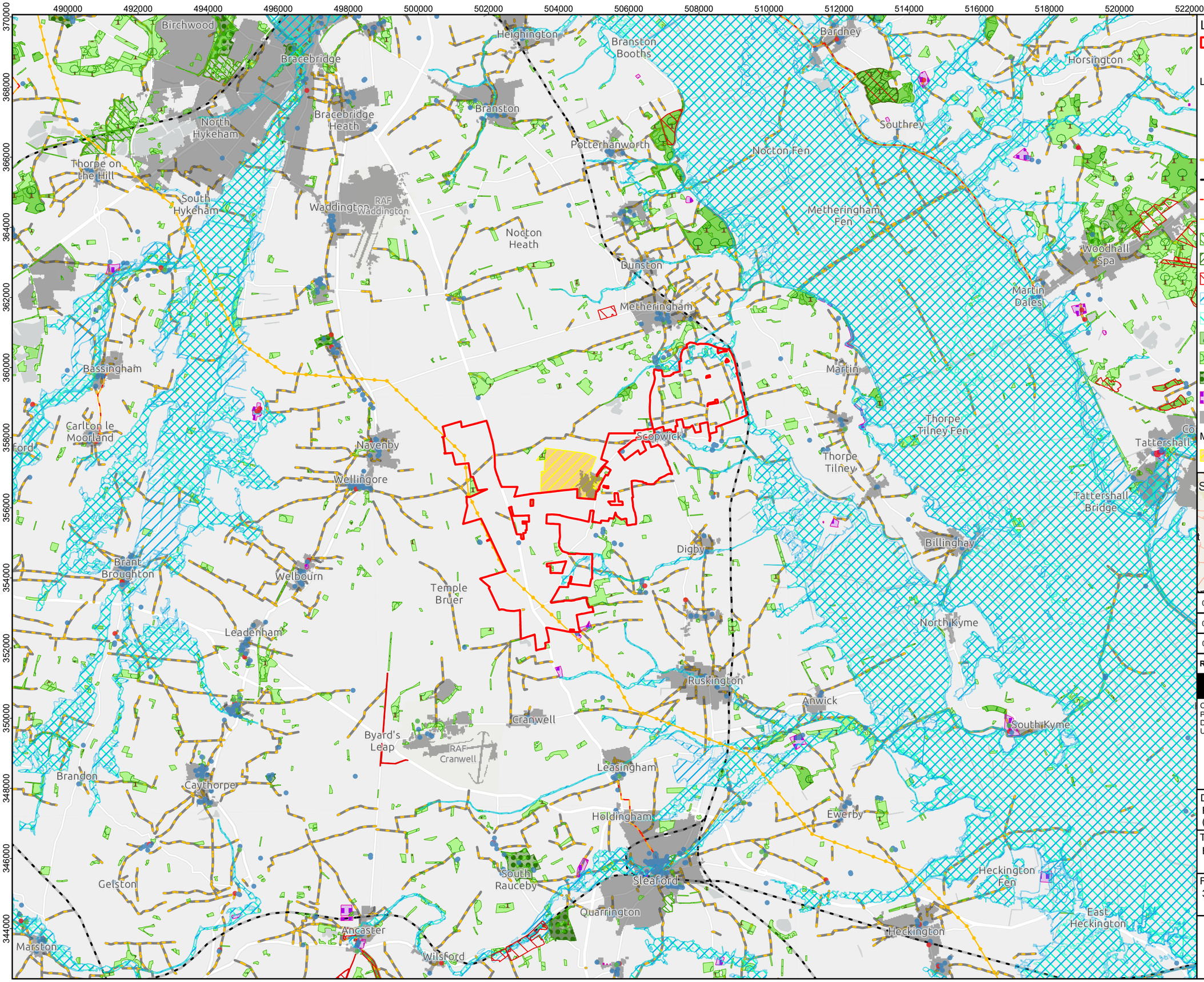
FIGURE NUMBER:
2.9

SCALE : 1:40,000 @ A3

0 2.5km

REV: P01

Figure 3.1
Environmental Considerations



LEGEND:

- Site Boundary
- National Grid Towers

Listed Building Grade

- I
- II
- II*
- Public Rights of Way
- Railway
- National Cycle Network
- National Grid OHL
- Local Nature Reserves
- National Nature Reserves
- Sites of Special Scientific Interest
- Flood Zone 2
- Flood Zone 3
- Ancient Woodland
- Woodland
- Registered Parks & Gardens
- Scheduled Monuments
- OS Built Up Areas

MOD Land

- RAF Digby

Rev	Date	Description	Drn	Chk	App
04	31/10/2023	New RLB	FA	JG	DP
03	23/08/2023	Updated Titles	FA	JG	DP
02	17/08/2023	Removed Layers	FA	JG	DP

Springwell Solar Farm

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Springwell Solar Farm

DOCUMENT:
Preliminary Environmental Information Report (PEIR)

TITLE:
Environmental Considerations

FIGURE NUMBER:
3.1

0 2 4
Kilometers
Scale: 1:100,000 @ A3

REV 04

Path: \\rsk-cloud\Projects\660000 - EPD Projects\663620 - Springwell Solar Farm\01 - GIS\P663620_constraints.aprx

Figure 3.2
Solar PV Design Development

LEGEND:

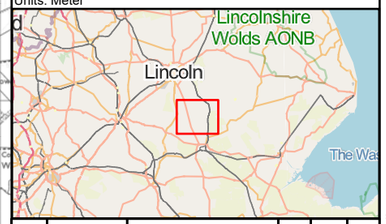
- Site Boundary
- Solar Fields

Potential area for solar development

- Stage 1 Design
- Stage 2 Design

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



Rev	Date	Description	Drn	Chk	App
04	30/11/2023	Title & Symbology	FA	JG	DP
03	31/10/2023	New RLB	FA	JG	DP
02	23/08/2023	Updated Titles	FA	JG	DP

Springwell Solar Farm

DOCUMENT:
Preliminary Environmental Information Report (PEIR)

TITLE:
Solar PV Design Development

FIGURE NUMBER:
3.2

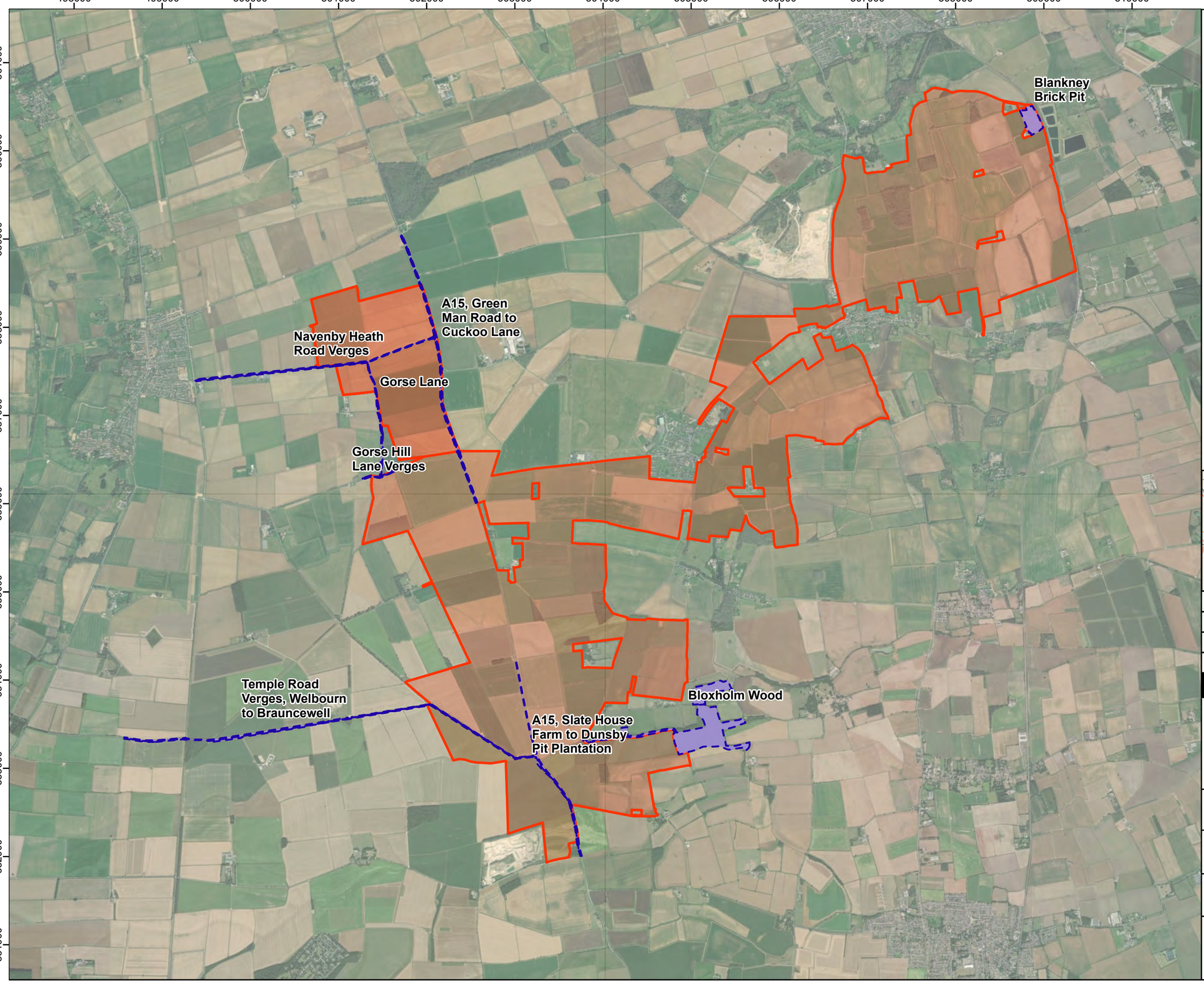
0 0.5 1
Kilometers

Scale: 1:40,000 @ A3

REV 04

Path: \\rsk-cloud\Projects\660000 - EPD Projects\663620 - Springwell Solar Farm\01 - GIS\P663620_masterSpringwell.aprx

Figure 6.1
Location of Local Wildlife Sites



LEGEND:

- Site Boundary
- Indicative Boundary of Local Wildlife Site (LWS)

NOTES:

Rev	Date	Description	Drn	Chk	App
00	27/10/2023	First Draft	RS	SP	FL

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
SPRINGWELL SOLAR FARM PEIR

TITLE:
LOCATION OF LOCAL WILDLIFE SITES ON AND IMMEDIATELY ADJACENT TO THE SITE

FIGURE NUMBER:
6.1

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\rebekah.smyth\RSK Group\RSK Biocensus - 06 GIS - 2483765 - EDF Solar Springwell (aka Acre Lane)\03 - APRX\2483765 - Springwell Solar - EDF - Fig 6.1 - Location of LWS.aprx\[empty]

Figure 8.1

Non-Designated Heritage Assets within 2km

500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000 511000

361000 360000 359000 358000 357000 356000 355000 354000 353000 352000

Metheringham
Blankney
Scopwick
Kirkby Green
Rowston
Ashby de la Launde
Digby
Dorrington

LEGEND:

- Monuments_point
- Monuments_line
- Monuments_polygon
- Site

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	03/10/2022	First Draft	AA	AA	AA

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:

TITLE:
Non-designated heritage assets within 2 km

FIGURE NUMBER:
8.1

0 0.5 1
Kilometers

Scale: 1:37,366 @ A3

REV 00

Path: A:\Consultancy\P22-216 Springwell Solar, formerly Acre Lane\10 GIS\04 GIS Project\03 GIS Project\PEIR template aprx\Figure 7.1

Figure 8.2

Designated Heritage Assets within 5km

496000 498000 500000 502000 504000 506000 508000 510000 512000 514000 516000

364000 362000 360000 358000 356000 354000 352000 350000 348000

LEGEND:

- Site
- Grade I listed buiding
- Grade II* listed building
- Grade II listed building
- Conservation Area
- Scheduled Monument

NOTES:

Coordinate System: WGS 1984 Web Mercator Auxiliary Sphere
Projection: Mercator Auxiliary Sphere
Datum: WGS 1984

Rev	Date	Description	Drn	Chk	App
00	03/10/2022	First Draft	AA	AA	AA

Springwell Solar Farm

DOCUMENT:

TITLE:
Non-designated heritage assets within 5 km

FIGURE NUMBER:
8.2

0 0.5 1
Kilometers

Scale: 1:116,033 @A3

REV 00

Path: A:\Consultancy\P22-216 Springwell Solar, formerly Acre Lane\10 GIS\04 GIS Project\03 GIS Project\PEIR template aprx\Figure 7.2

Figure 8.3
Sensitive Heritage Receptors

500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000 511000 512000 513000

362000 361000 360000 359000 358000 357000 356000 355000 354000 353000 352000 351000

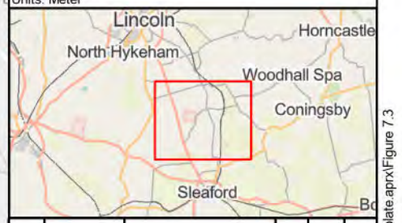
Metheringham
Blankney
Martin
affoe
nby
Timberland
Scopwick
Kirkby Green
Rowston
Ashby de la Launde
Digby
Dorrington
Ruskington
Anwick

LEGEND:

- Non-designated heritage asset
- Grade II listed building
- Scheduled Monument
- Conservation Area
- Site

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



Rev	Date	Description	Drn	Chk	App
00	03/10/2022	First Draft	AA	AA	AA

Springwell Solar Farm

DOCUMENT:

TITLE:
Sensitive heritage receptors

FIGURE NUMBER:
8.3

0 0.5 1
Kilometers

Scale: 1:41,784 @ A3

REV 00

Path: A:\Consultancy\P22-216 Springwell Solar, formerly Acre Lane\10 GIS\04 GIS Project\03 GIS Project\PEIR template aprx\Figure 7.3

Figure 9.1

Landscape Study Area, Context and Designations

496000 497000 498000 499000 500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000 511000 512000 513000 514000

363000 362000 361000 360000 359000 358000 357000 356000 355000 354000 353000 352000 351000 350000 349000

B1188 Durston Metheringham B1189 Blankney A607 A15 Martin B1191 Timberland Navenby and Wellingore Scopwick Main St. Kirkby Green Heath Road RAF Digby B1189 B1188 Ashby de la Launde Digby B1191 Dorrington Ruskington Cranwell A15 A607

bing

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Legend:

- Proposed Site Boundary
- Primary LVIA Study Area
- Main Roads
- Settlement
- Lincoln Cliff Area of Great Landscape Value

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Landscape Study Area, Context and Designations

FIGURE NUMBER:
9.1

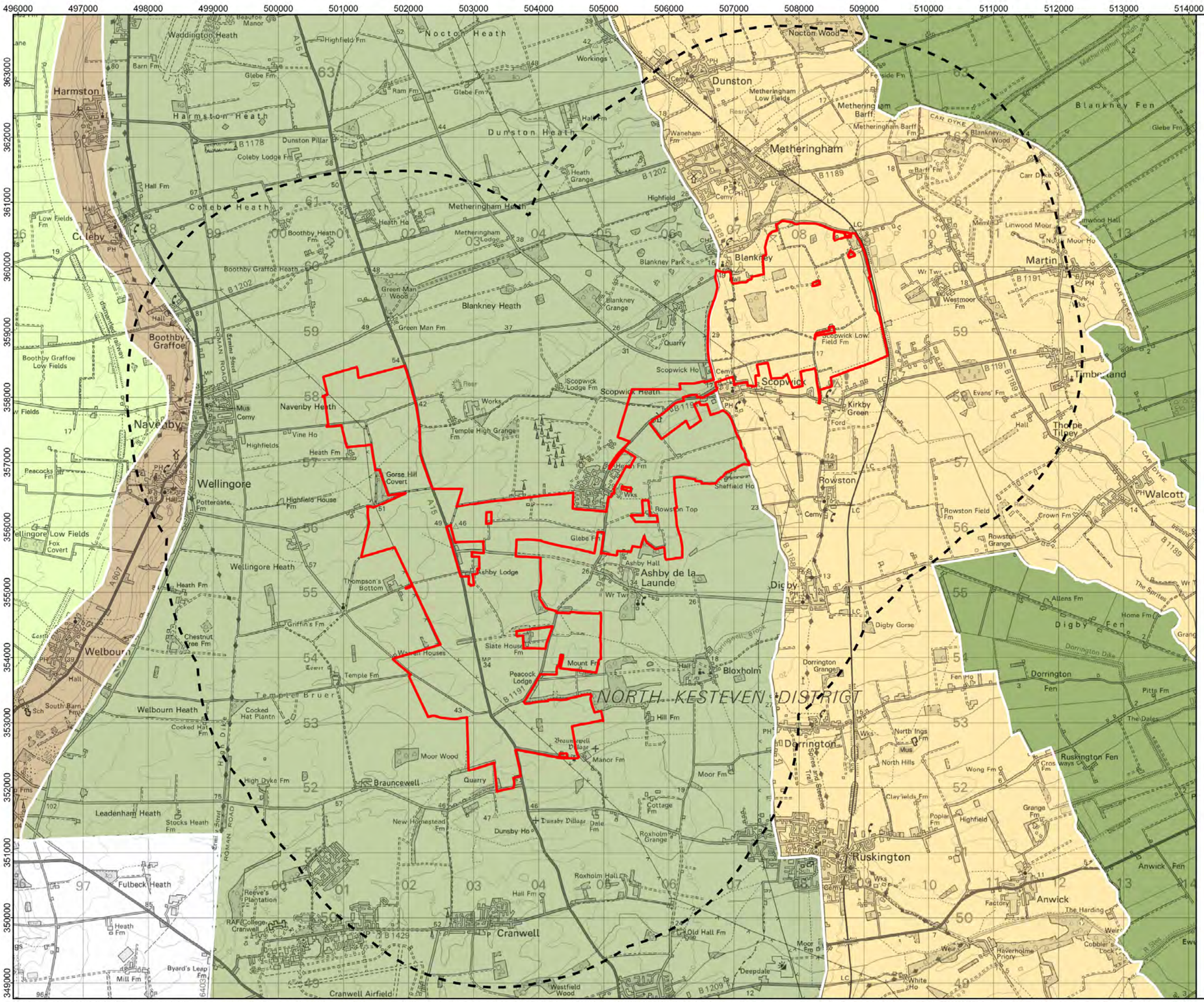
0 0.5 1
Kilometers

Scale: 1:55,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-1 Landscape Study Area

Figure 9.2
Landscape Character



Legend:

- Proposed Site Boundary
- Primary LVIA Study Area

North Kesteven Landscape Character Assessment (2007)

- 5: Witham Brent Vales
- 6: Lincoln Cliff
- 7: Limestone Heath
- 11: Central Clays and Gravels
- 13: Fenland

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Landscape Character

FIGURE NUMBER:
9.2

0 0.5 1
Kilometers

Scale: 1:55,000 @ A3

REV 00

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Figure 9.3
Visual Receptors

Extent of figure 9.3b

Extent of figure 9.3c

Extent of figure 9.3d

Legend:

- Proposed Site Boundary
- Public Rights of Way
- Spires and Steeples Trail
- Stepping Out Routes
- Ridges and Furrows Trail
- Viking Way
- Main Roads
- Other Roads
- Settlement
- Recreational Receptors
- Extent of Detail Sheets

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Visual Receptors - Springwell Overview

FIGURE NUMBER:
9.3a

0 0.5 1
Kilometers
Scale: 1:48,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBYRSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-3 Visual Receptors

Legend:

- Proposed Site Boundary
- Public Rights of Way
- Spires and Steeples Trail
- Stepping Out Routes
- Main Roads
- Other Roads
- Settlement
- Recreational Receptors
- 2 RAF Digby Sports Fields
- 3 Scopwick Cemetery and Play Area
- 4 Blankney Golf Club
- 5 Blankney Walks Car Park and Picnic Area
- 6 Metheringham Airfield Visitor Centre
- 7 Kirkby Green Stepping Out Car Park

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

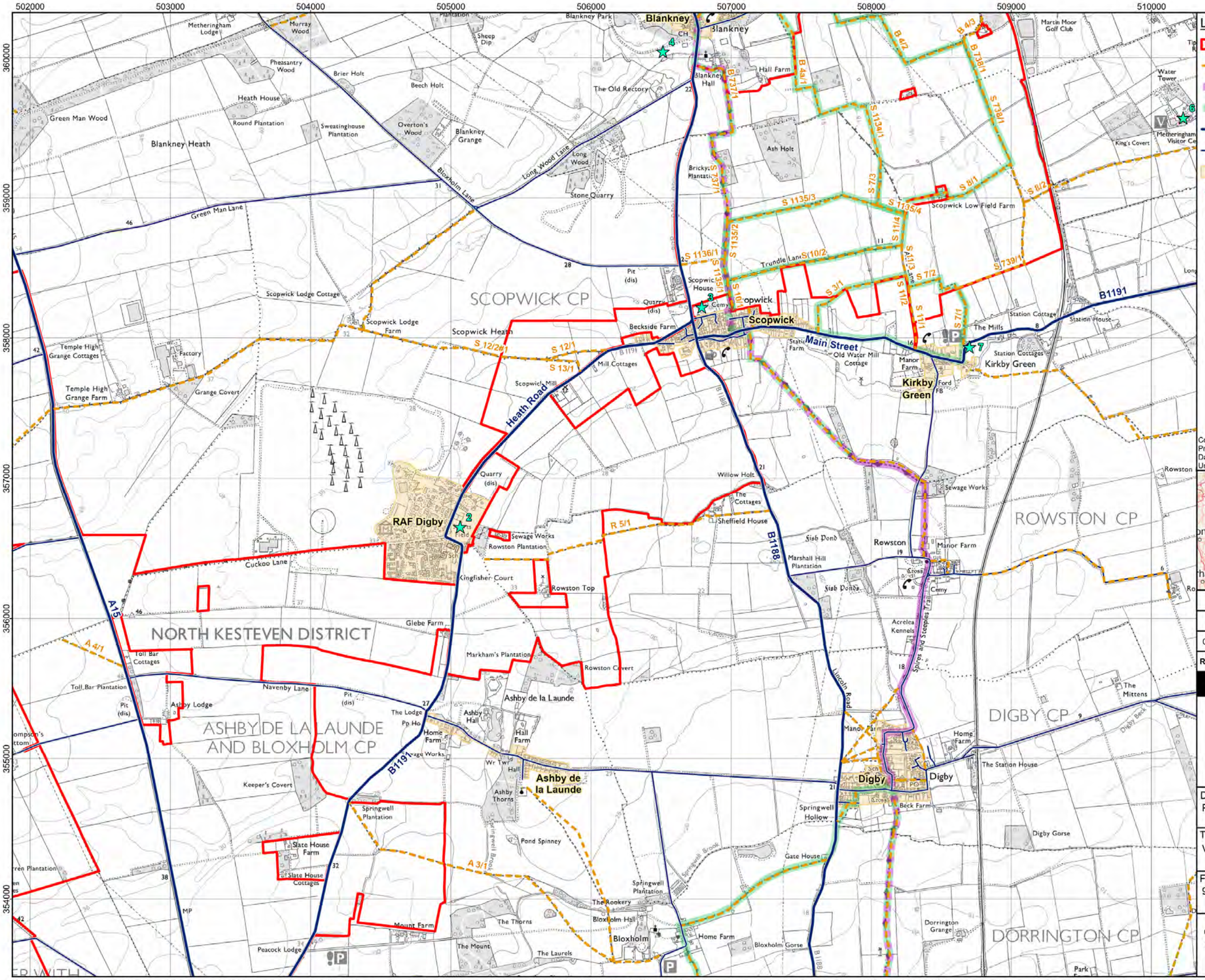
TITLE:
Visual Receptors - Springwell East

FIGURE NUMBER:
9.3b

0 0.5 1
Kilometers
Scale: 1:25,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-3 Visual Receptors



Legend:

- Proposed Site Boundary
- Public Rights of Way
- Spires and Steeples Trail
- Stepping Out Routes
- Ridges and Furrows Trail
- Viking Way
- Main Roads
- Other Roads
- Settlement
- Recreational Receptors
- 1 Bloxholm Woods Layby and Nature Reserve Walk
- 2 RAF Digby Sports Fields
- 3 Scopwick Cemetery and Play Area

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Visual Receptors - Springwell West

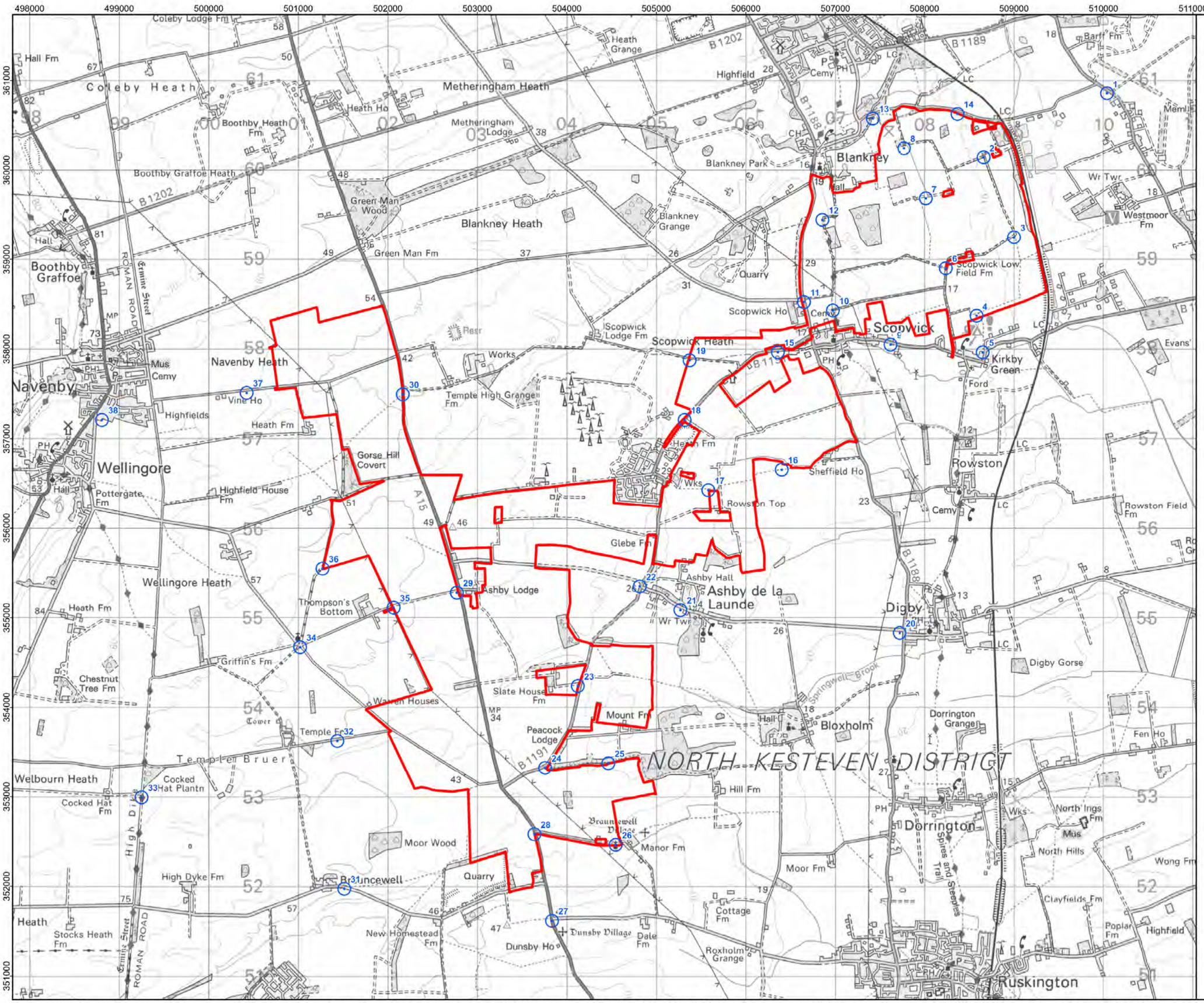
FIGURE NUMBER:
9.3d

0 0.5 1
Kilometers
Scale: 1:30,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-3 Visual Receptors

Figure 9.4
Viewpoint Location Plan



Legend:

- Proposed Site Boundary
- Viewpoints

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Viewpoint Location Plan

FIGURE NUMBER:
9.4

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHEL5BY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-4 Viewpoints

Figure 9.5
Solar PV Standard ZTVs

Extent of figure 9.5b

Extent of figure 9.5c

Extent of figure 9.5d

NORTH KESTEVEN DISTRICT

Legend:

- Proposed Site Boundary
- Proposed Solar PV Modules
- Distance Radii from Proposed Solar PV Modules (1, 2, 3km)
- Viewpoints
- Existing Woodland
- Solar PV Modules may be visible

NOTES:
Layout file: D004-obvs-panels-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The model does not take into account some localised features such as hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
The ZTV does not include inverters, transformers or switchgear compounds and shows the visibility of the solar PV panels only.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Standard ZTV of Solar PV Modules

FIGURE NUMBER:
9.5a

0 1 2
Kilometers
Scale: 1:60,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-5a Solar Parcels Combined ZTV Standard

Legend:

- Proposed Site Boundary
- Proposed Solar PV Modules
- Distance Radii from Proposed Solar PV Modules (1, 2, 3km)
- Viewpoints
- Existing Woodland
- Solar PV Modules may be visible

NOTES:
Layout file: D004-obvs-panels-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The model does not take into account some localised features such as hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
The ZTV does not include inverters, transformers or switchgear compounds and shows the visibility of the solar PV panels only.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Standard Screening ZTV of Solar PV Modules - East Parcel

FIGURE NUMBER:
9.5b

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-5b-d Solar ZTVs Standard

Legend:

- Proposed Site Boundary
- Proposed Solar PV Modules
- Distance Radii from Proposed Solar PV Modules (1, 2, 3km)
- Viewpoints
- Existing Woodland
- Solar PV Modules may be visible

NOTES:
Layout file: D004-obvs-panels-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The model does not take into account some localised features such as hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
The ZTV does not include inverters, transformers or switchgear compounds and shows the visibility of the solar PV panels only.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

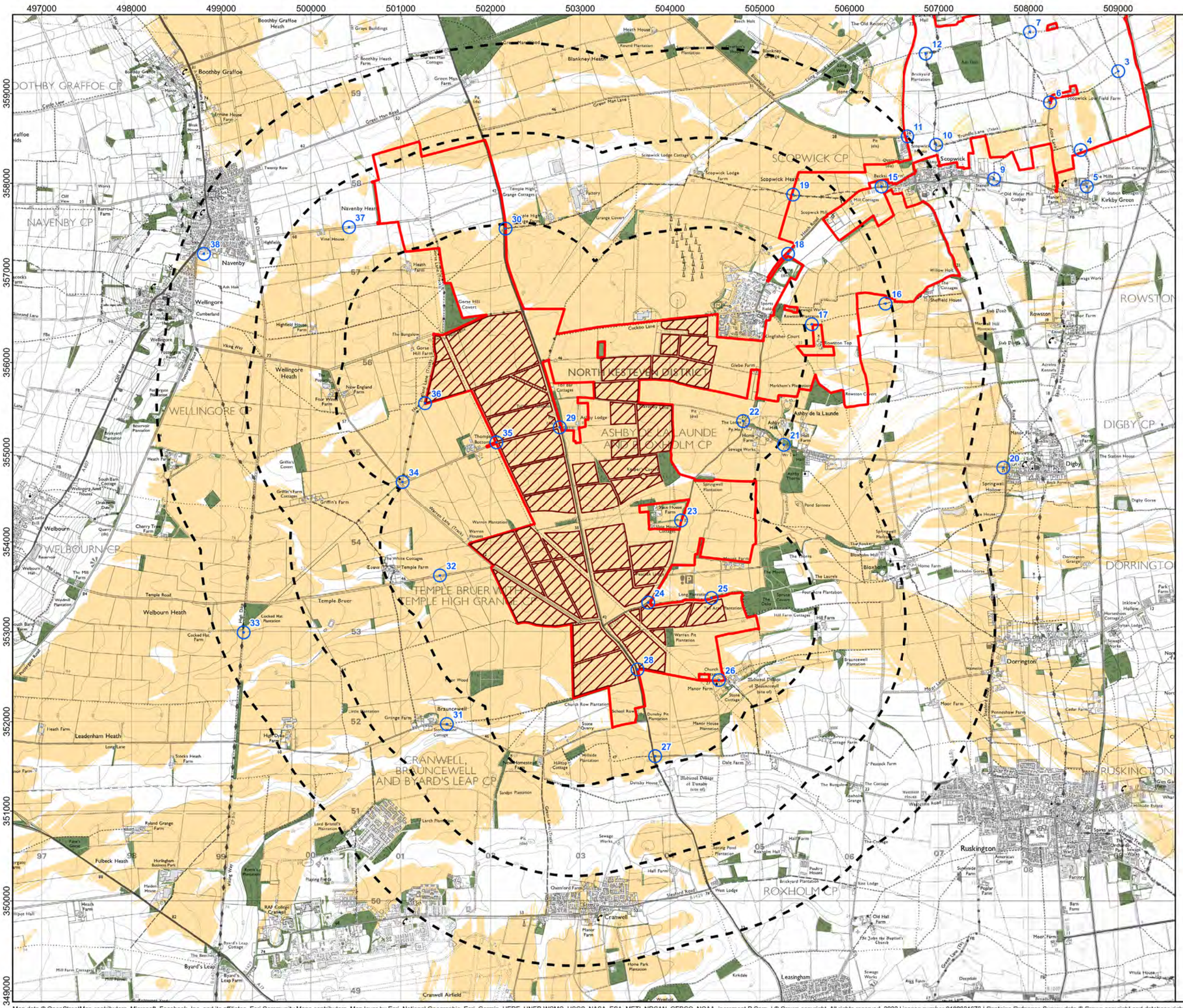
TITLE:
Standard Screening ZTV of Solar PV Modules - Central Parcel

FIGURE NUMBER:
9.5c

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-5b-d Solar ZTVs Standard



Legend:

- Proposed Site Boundary
- Proposed Solar PV Modules
- Distance Radii from Proposed Solar PV Modules (1, 2, 3km)
- Viewpoints
- Existing Woodland
- Solar PV Modules may be visible

NOTES:
Layout file: D004-obvs-panels-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-5m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The model does not take into account some localised features such as hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
The ZTV does not include inverters, transformers or switchgear compounds and shows the visibility of the solar PV panels only.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Standard Screening ZTV of Solar PV Modules - West Parcel

FIGURE NUMBER:
9.5d

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-5b-d Solar ZTVs Standard

Figure 9.6

Solar PV Detailed Screening ZTVs

Extent of figure 9.5b

Extent of figure 9.5c

Extent of figure 9.5d

NORTH KESTEVEN DISTRICT

Legend:

- Proposed Site Boundary
- Proposed Solar PV Modules
- Distance Radii from Proposed Solar PV Modules (1, 2, 3km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Solar PV Modules may be visible
- Extent of Detail Sheets

NOTES:
Layout file: D004-obvs-panels-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. The locations of buildings have been taken from the OS Open Map Local dataset and vegetation/woodland from the Environment Agency's Vegetation Object Model (2021) dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 2m² resolution.
The ZTV does not include inverters, transformers or switchgear compounds and shows the visibility of the solar PV panels only.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

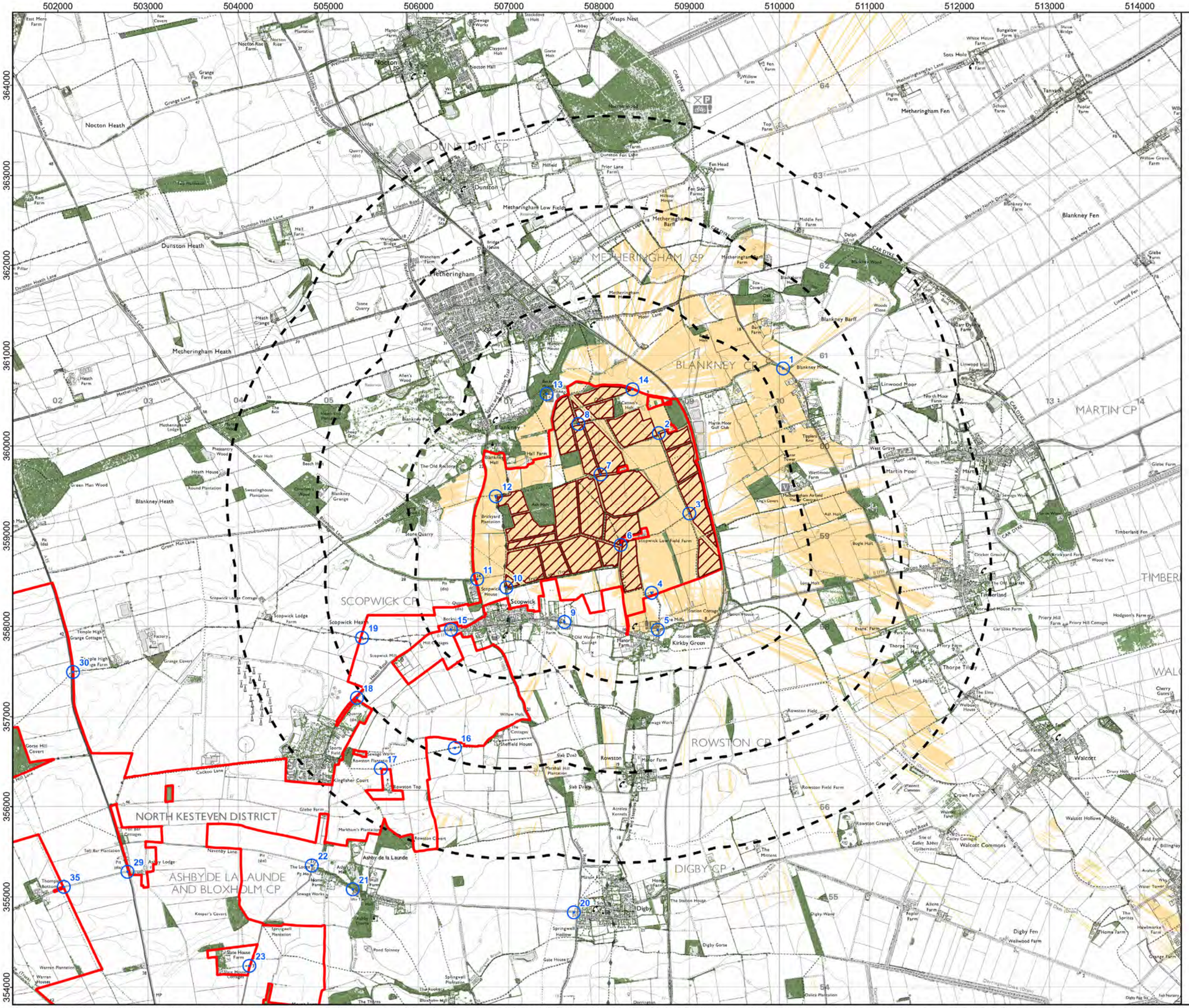
TITLE:
Detailed ZTV of Solar PV Modules

FIGURE NUMBER:
9.6a

0 1 2
Kilometers
Scale: 1:60,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-6a Solar Parcels Combined ZTV Detailed



Legend:

- Proposed Site Boundary
- Proposed Solar PV Modules
- Distance Radii from Proposed Solar PV Modules (1, 2, 3km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Solar PV Modules may be visible

NOTES:
Layout file: D004-obvs-panels-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 2m² resolution.
The ZTV does not include inverters, transformers or switchgear compounds and shows the visibility of the solar PV panels only.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

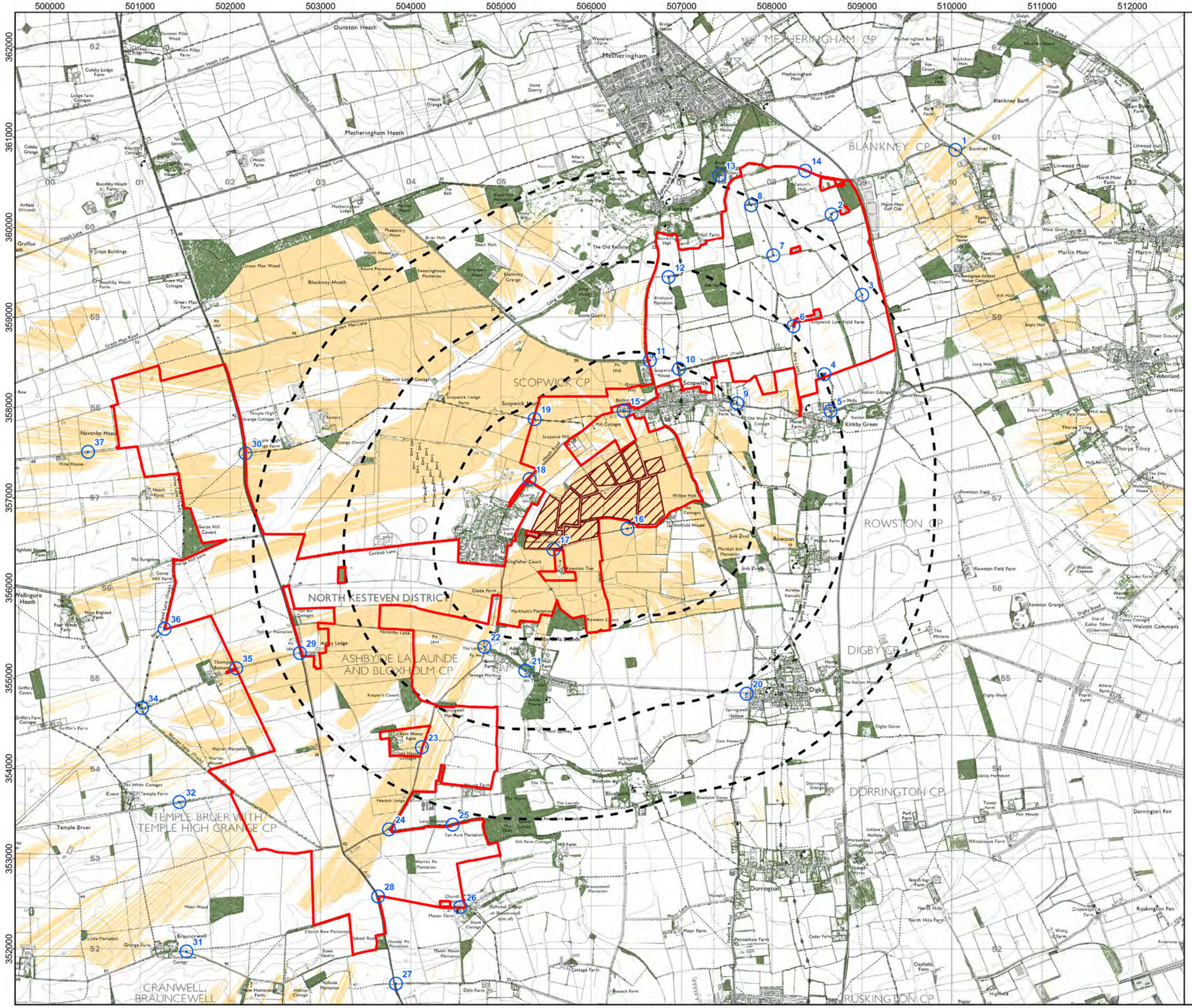
TITLE:
Detailed Screening ZTV of Solar PV Modules - East Parcel

FIGURE NUMBER:
9.6b

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-6b-d Solar ZTVs Detailed



Legend:

- Proposed Site Boundary
- Proposed Solar PV Modules
- Distance Radii from Proposed Solar PV Modules (1, 2, 3km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Solar PV Modules may be visible

NOTES:
Layout file: D004-obvs-panels-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 2m² resolution.
The ZTV does not include inverters, transformers or switchgear compounds and shows the visibility of the solar PV panels only.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

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Springwell Solar Farm

DOCUMENT:
PEIR

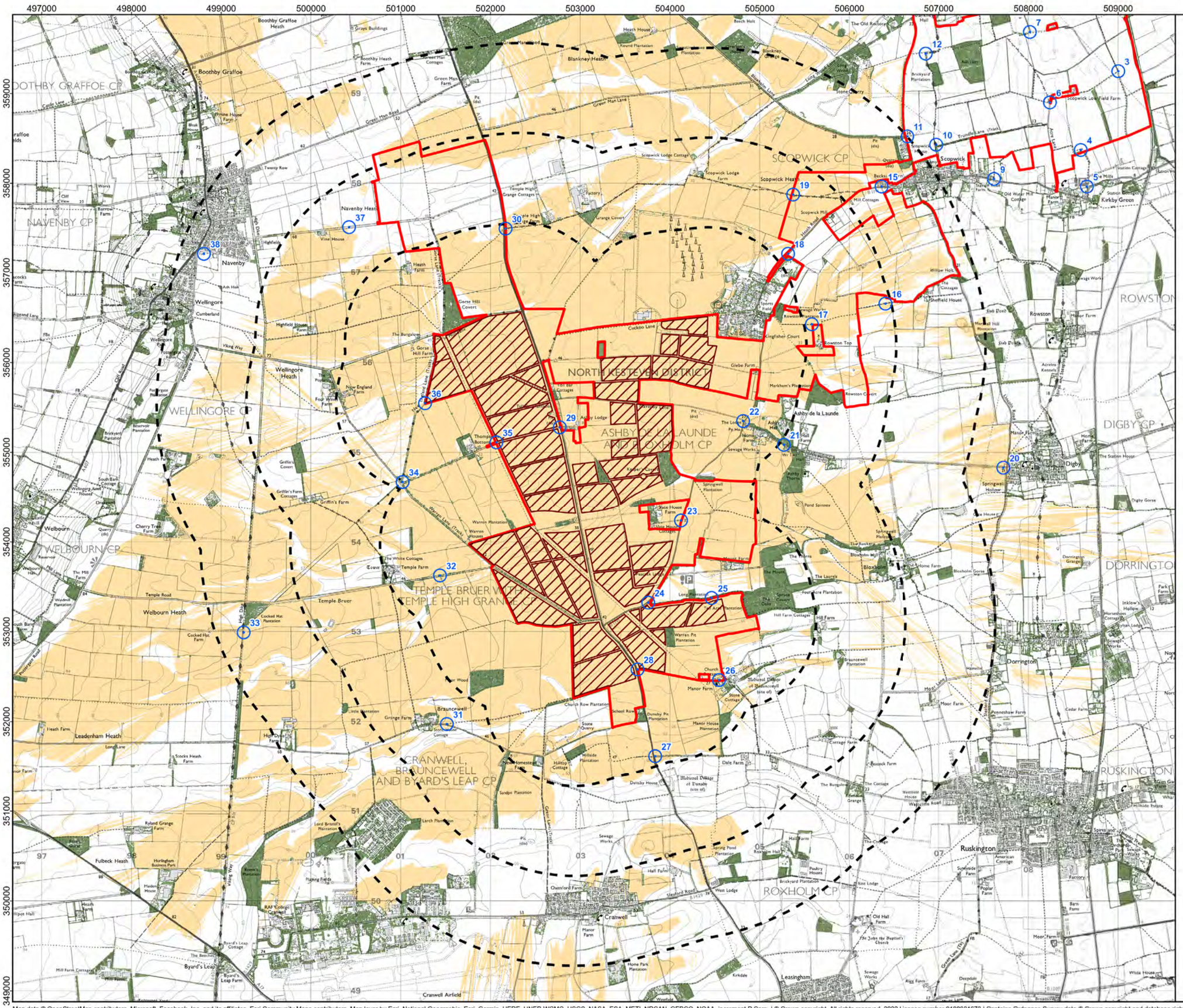
TITLE:
Detailed Screening ZTV of Solar PV Modules - Central Parcel

FIGURE NUMBER:
9.6c

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-6b-d Solar ZTVs Detailed



Legend:

- Proposed Site Boundary
- Proposed Solar PV Modules
- Distance Radii from Proposed Solar PV Modules (1, 2, 3km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Proposed Solar PV Modules may be visible

NOTES:
Layout file: D004-obvs-panels-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS. The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings. A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 2m² resolution.
The ZTV does not include inverters, transformers or switchgear compounds and shows the visibility of the solar PV panels only.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Detailed Screening ZTV of Solar PV Modules - West Parcel

FIGURE NUMBER:
9.6d

0 0.5 1
Kilometers
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-6b-d Solar ZTVs Detailed

Figure 9.7
Siting Zone 6m ZTVs

Extent of figure 9.7b

Extent of figure 9.7c

Extent of figure 9.7d

Extent of figure 9.7e

HARMSTON CP
COLEBY CP
BOOTHBY GRAFFOE CP
NAVENBY CP
WELLINGORE CP
WELBOURN CP
TEMPLE BRUER WITH TEMPLE HIGH GRANGE CP
CRANWELL, BRAUNCEWELL AND BYARD'S LEAP CP
ASHBY DE LA LAUNDE AND BLOXHOLM CP
NORTH KESTEVEN DISTRICT
DUNSTON CP
METHERINGHAM CP
BLANKNEY CP
MARTIN CP
SCOPWICK CP
ROWSTON CP
DIGBY CP
DORRINGTON CP
ROXHOLM CP
ROSKINGTON CP
ANWICK CP
EWERBY AND EVEDON CP

Legend:

- Proposed Site Boundary
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Extent of Detail Sheets

NOTES:
Layout file: D004-obvs-sitingAreas-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 2m² resolution.
The ZTV does not show cable route corridors, boundary fencing and CCTV, inverter and transformers and switchgear compounds, National Grid Sealing End Compound and additional 400kV towers.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

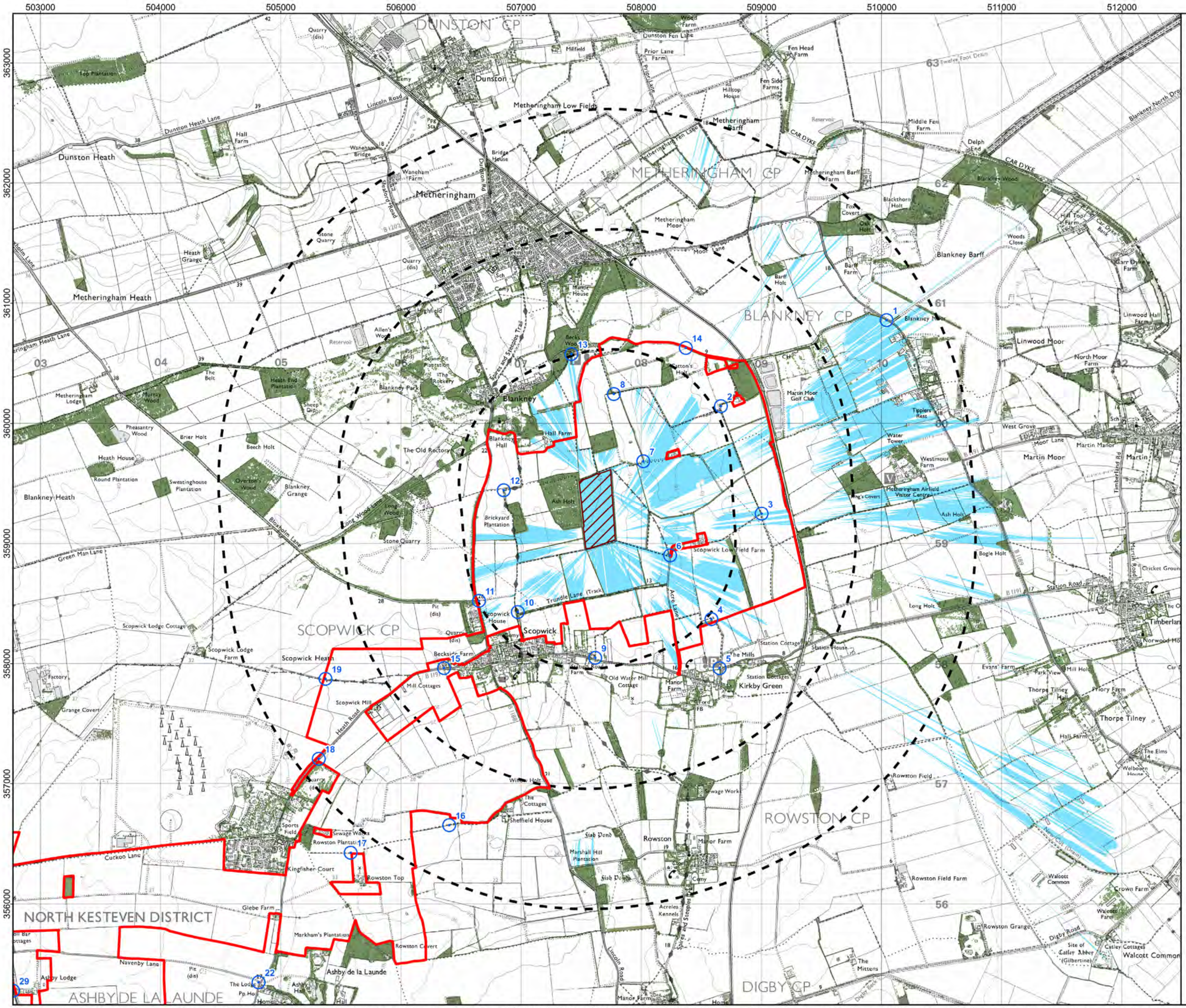
TITLE:
Detailed Screening ZTV of Siting Zone - Overview

FIGURE NUMBER:
9.7a

0 0.5 1
Kilometers
Scale: 1:55,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-7a-d Siting Zone ZTVs Detailed



Legend:

- Proposed Site Boundary
- Siting Area
- Distance Radii from Siting Area (1, 2, 3km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Siting zone for structures up to 6m high may be visible

NOTES:
Layout file: D004-obvs-sitingAreas-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a $2m^2$ resolution.
The ZTV does not show cable route corridors, boundary fencing and CCTV, inverter and transformers and switchgear compounds, National Grid Sealing End Compound and additional 400kV towers.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Detailed Screening ZTV of Siting Zone - for structures up to 6m (East Parcel)

FIGURE NUMBER:
9.7b

0 0.5 1
Kilometers
Scale: 1:30,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-7a-d Siting Zone ZTVs Detailed

501000 502000 503000 504000 505000 506000 507000 508000 509000 510000

360000 359000 358000 357000 356000 355000 354000 353000

BLANKNEY CP
SCOPWICK CP
NORTH KESTEVEN DISTRICT
ASHBY DE LA LAUNDE AND BLOXHOLM CP
TEMPLE BRUER WITH TEMPLE HIGH GRANGE CP
ROWSTON CP
DIGBY CP
DORRINGTON CP

Blankney
Scopwick
Kirkby Green
Ashby de la Launde
Digby
Rowston
Dorrington
Sheffield
Lincoln
Peterborough

Blankney Heath
Green Man Wood
Gorse Hill Covert
Grange Covert
Rowston Covert
Springwell Plantation
Bloxholm Gorse
Digby Gorse
Martin Moor Golf Club
Metheringham Airfield Visitor Centre

Metheringham Heath Lane
Green Man Lane
Long Wood Lane
Bloxholm Lane
Trundle Lane (Track)
Heath Road
Cuckoo Lane
Gorse Hill Lane
Warren Lane (Track)
Newfoundland Lane (Track)
Ravenby Lane
Spires and Steeples Trail
Lincoln Road
Roman Bank

Legend:

- Proposed Site Boundary
- Siting Area
- Distance Radii from Siting Area (1, 2, 3km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Siting zone for structures up to 6m high may be visible

NOTES:
Layout file: D004-obvs-sitingAreas-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a $2m^2$ resolution.
The ZTV does not show cable route corridors, boundary fencing and CCTV, inverter and transformers and switchgear compounds, National Grid Sealing End Compound and additional 400kV towers.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

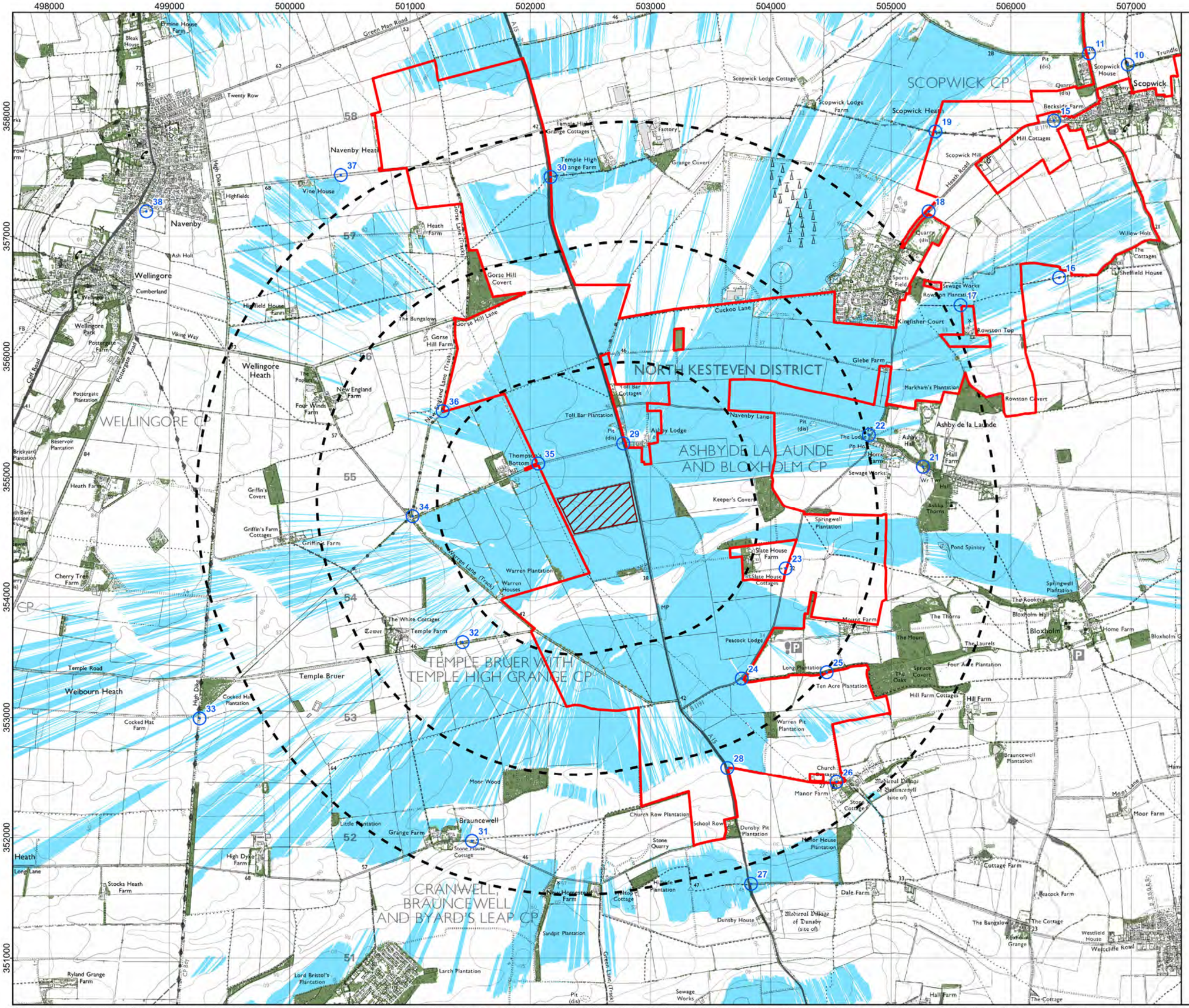
TITLE:
Detailed Screening ZTV of Siting Zone - for structures up to 6m (Central Parcel)

FIGURE NUMBER:
9.7c

0 0.5 1
Kilometers
Scale: 1:30,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-7a-d Siting Zone ZTVs Detailed



Legend:

- Proposed Site Boundary
- Siting Area
- Distance Radii from Siting Area (1, 2, 3km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Siting zone for structures up to 6m high may be visible

NOTES:
Layout file: D004-obvs-sitingAreas-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 2m² resolution.
The ZTV does not show cable route corridors, boundary fencing and CCTV, inverter and transformers and switchgear compounds, National Grid Sealing End Compound and additional 400kV towers.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

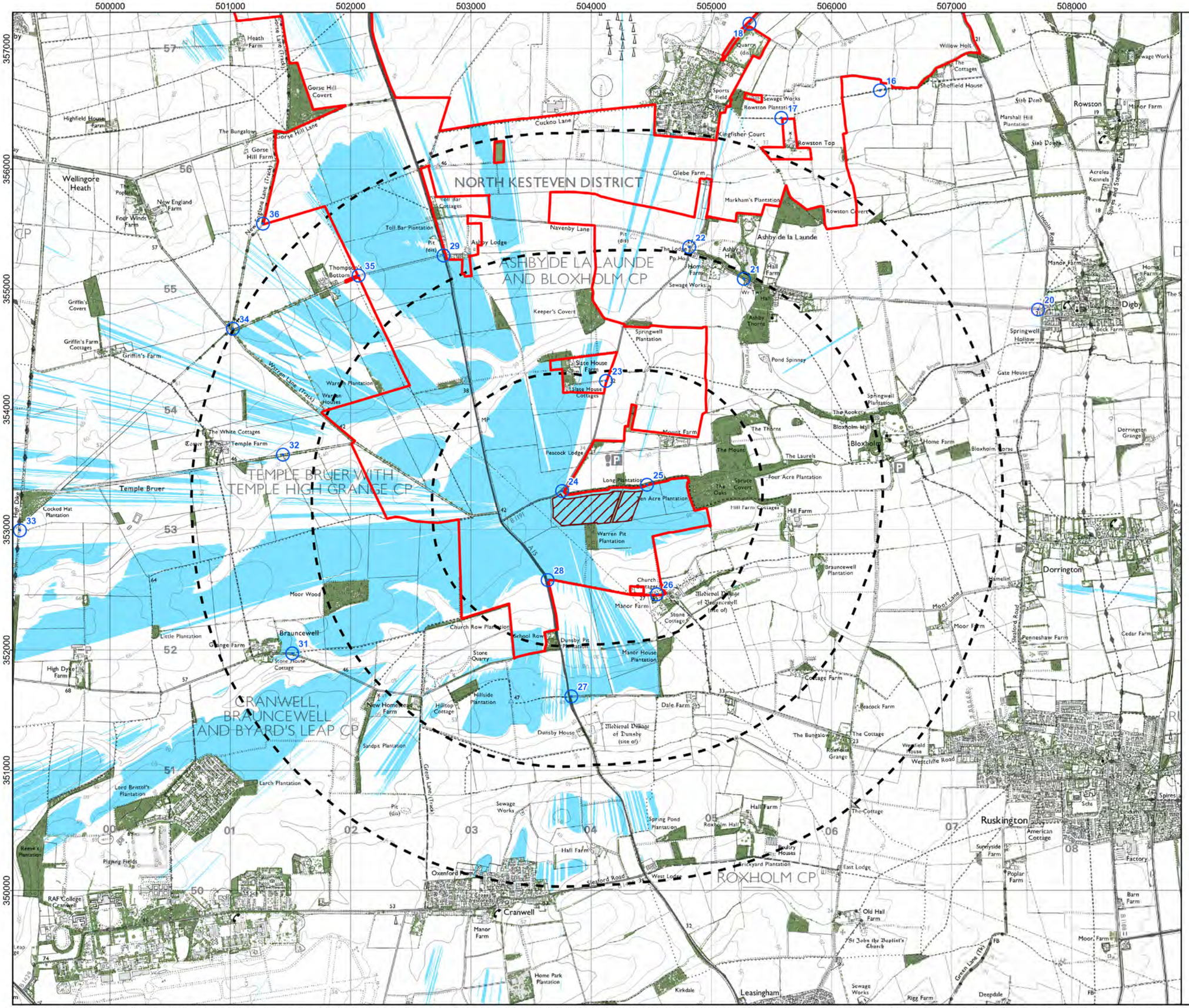
TITLE:
Detailed Screening ZTV of Siting Zone - for structures up to 6m (West Parcel Option 1)

FIGURE NUMBER:
9.7d

0 0.5 1
Kilometers
Scale: 1:30,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKTHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-7a-d Siting Zone ZTVs Detailed



Legend:

- Proposed Site Boundary
- Siting Area
- Distance Radii from Siting Area (1, 2, 3km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Siting zone for structures up to 6m high may be visible

NOTES:
Layout file: D004-obvs-sitingAreas-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data.
The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a $2m^2$ resolution.
The ZTV does not show cable route corridors, boundary fencing and CCTV, inverter and transformers and switchgear compounds, National Grid Sealing End Compound and additional 400kV towers.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Detailed Screening ZTV of Siting Zone - for structures up to 6m (West Parcel Option 2)

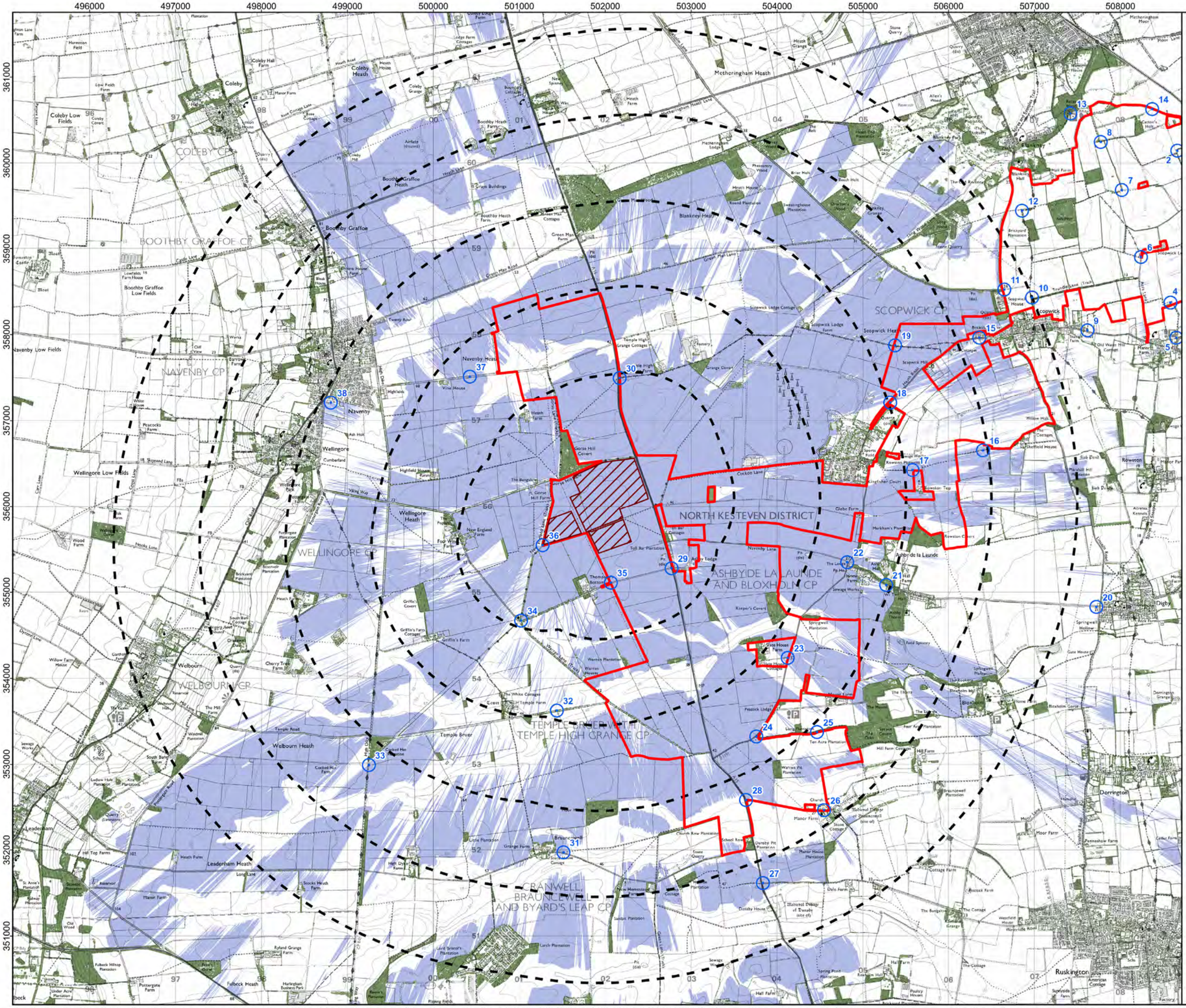
FIGURE NUMBER:
9.7e

0 0.5 1
Kilometers
Scale: 1:30,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-7a-d Siting Zone ZTVs Detailed

Figure 9.8
Siting Zone 12m ZTVs



Legend:

- Proposed Site Boundary
- Siting Area
- Distance Radii from Siting Area (1, 2, 3, 4, 5km)
- Viewpoints
- Existing Woodland and Vegetation higher than 2.5m
- Siting zone for structures up to 12m high may be visible

NOTES:
Layout file: D008-obvs-sitingAreas-LiDAR-5km.shp
Terrain data: DEFRA-LiDAR-2022-derivedDSM-VOM-2m.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 2m
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS. The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings. A digital surface model (DSM) has been derived from DEFRA 2022 2m DTM height data. Locations of buildings are taken from the OS Open Map Local dataset and woodland from the EA's Vegetation Object Model dataset. Heights of buildings and woodland are taken from DEFRA 2022 2m DSM height data. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a $2m^2$ resolution.
The ZTV does not show cable route corridors, boundary fencing and CCTV, inverter and transformers and switchgear compounds, National Grid Sealing End Compound and additional 400kV towers.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Detailed Screening ZTV of Siting Zone for Structures up to 12m (West Parcel)

FIGURE NUMBER:
9.8

0 0.5 1
Kilometers
Scale: 1:42,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620 aprx\PEIR 9-8 12m Siting Zone ZTV Detailed

Figure 9.9
Residential Property Location Plan

499000 500000 501000 502000 503000 504000 505000 506000 507000 508000 509000 510000

361000 360000 359000 358000 357000 356000 355000 354000 353000 352000

Brickyard Farm

Scopwick Low Field Farm

The Oval (RAF Digby)

Toll Bar Cottage

Lupus Lair

Gorse Hill Bungalow

1-2 Ashby Lodge Cottage

Mallory Road (RAF Digby)

Eastfield and Westfield Cottages

Gorse Hill Farm

Sheffield House

1, 2, 3 & 4 Thompson's Bottom Cottages (4 properties)

The Maltings, The Hayloft and The Granary

Thompson's Bottom Farm

Old Blacksmiths Lodge

1&2 Rowston Hill Top Cottages, Fleur-de-lys, Woodview and Fieldview (5 properties)

5 Thompson's Bottom Cottage

Slate House Barn

3&4 Slate House Cottages (2 properties)

6-7 Thompson's Bottom Cottage

1&2 Slate House Cottage

3&4 Ashby Lodge Cottages (2 properties)

1&2 Peacock Lodge Cottages (2 properties)

SCOPWICK CP

NORTH KESTEVEN DISTRICT

ASHBY DE LA LAUNDE AND BLOXHOLME CP

TEMPLE BRUER WITH TEMPLE HIGH GRANGE CP

ROWSTON CP

DIGBY CP

DORRINGTON CP

Legend:

- Proposed Site Boundary
- Residential Properties
- Areas for Solar PV Development
- Siting Zones for 6/12m Structures
- 200m Buffer from Areas for Solar PV Development
- Buffers from Siting Zones (400m from 6m structures/ 800m from 12m structures)

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	24/10/2023	First Issue	MP	JI	

Springwell Solar Farm

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DOCUMENT:
PEIR

TITLE:
RVAA Residential Property Location Plan

FIGURE NUMBER:
9.9

0 0.5 1
Kilometers

Scale: 1:35,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 200s - 0297 - Acre Lane Solar Farm\05 Working Files\02 GIS\P663620.aprx\PEIR 9-9 RVAA

Figure 10.1
Agricultural Land Classification

LEGEND:

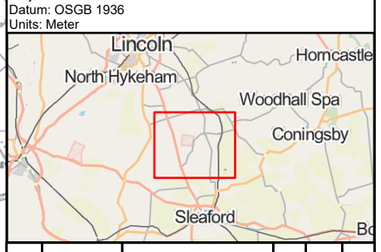
- Site Boundary

ACL 100m

- Grade 1
- Grade 2
- Grade 3a
- Grade 3b
- Grade 4

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter



Rev	Date	Description	Drn	Chk	App
03	31/10/2023	New RLB	FA	JG	DP
02	23/08/2023	Updated Titles	FA	JG	DP
01	15/08/2023	Symbology	FA	JG	DP

Springwell Solar Farm

DOCUMENT:
Preliminary Environmental Information Report (PEIR)

TITLE:
Agricultural Land Classification (100m)

FIGURE NUMBER:
10.1

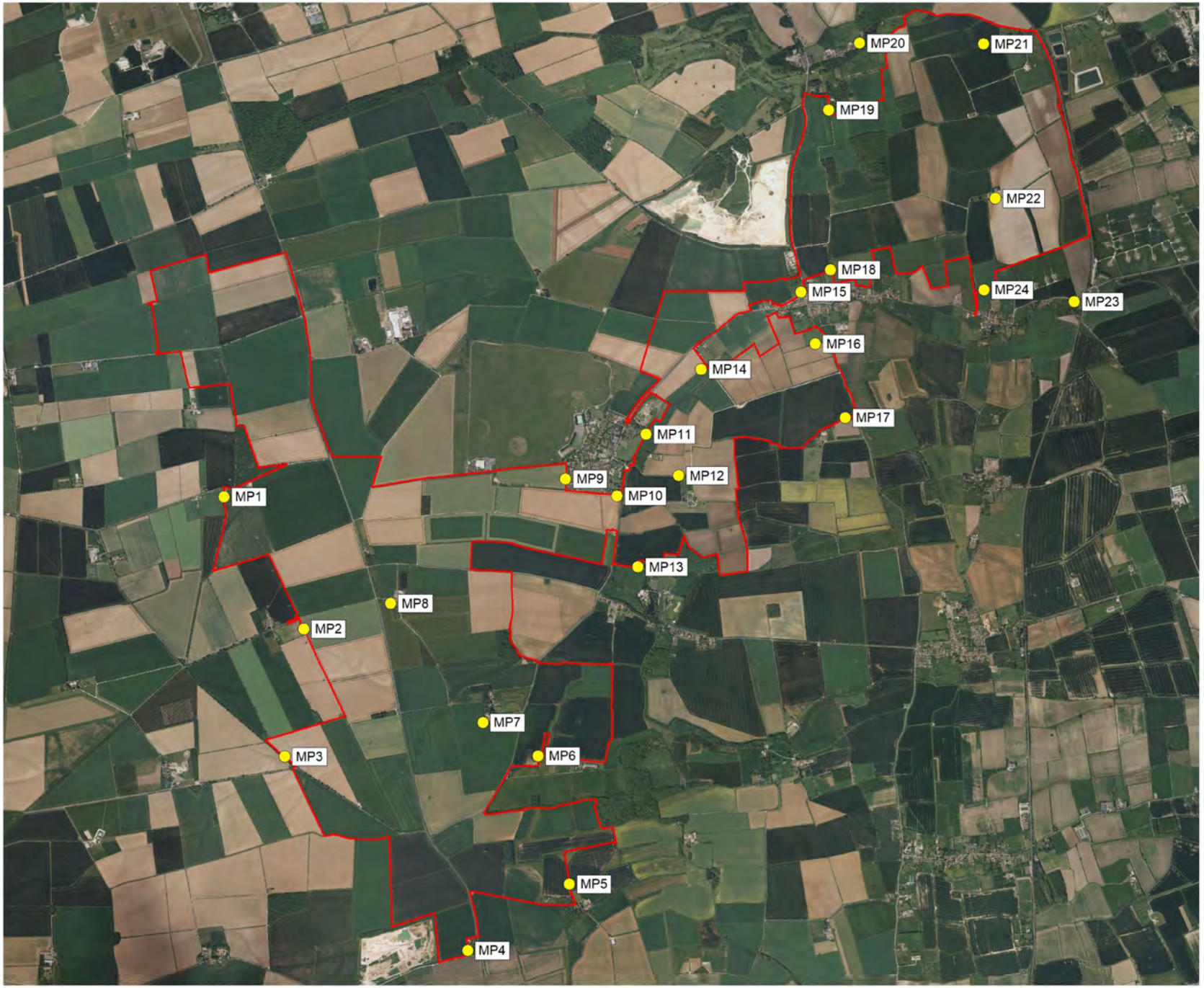
0 0.5 1
Kilometers

Scale: 1:35,000 @ A3

REV 03

Path: \\rsk-cloud\Projects\660000 - EPD Projects\663620 - Springwell Solar Farm\01 - GIS\P663620_ALC.aprx

Figure 11.1
Baseline Noise Locations



LEGEND:

- Site Boundary
- Baseline Monitoring Location

NOTES:

Baseline monitoring positions considered representative of those nearest sensitive receptors (in noise terms)

Coordinate System: British National Grid Projection: Transverse Mercator Datum: OSGB 1936 Units: Meter

Rev	Date	Description	Drn	Chk	App
01	08/11/2023	Issued	JM	DC	DC
00	10/08/2023	First Draft	JM	DC	DC

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:

PEIR - Location Map

TITLE:

Baseline Monitoring Locations

FIGURE NUMBER:

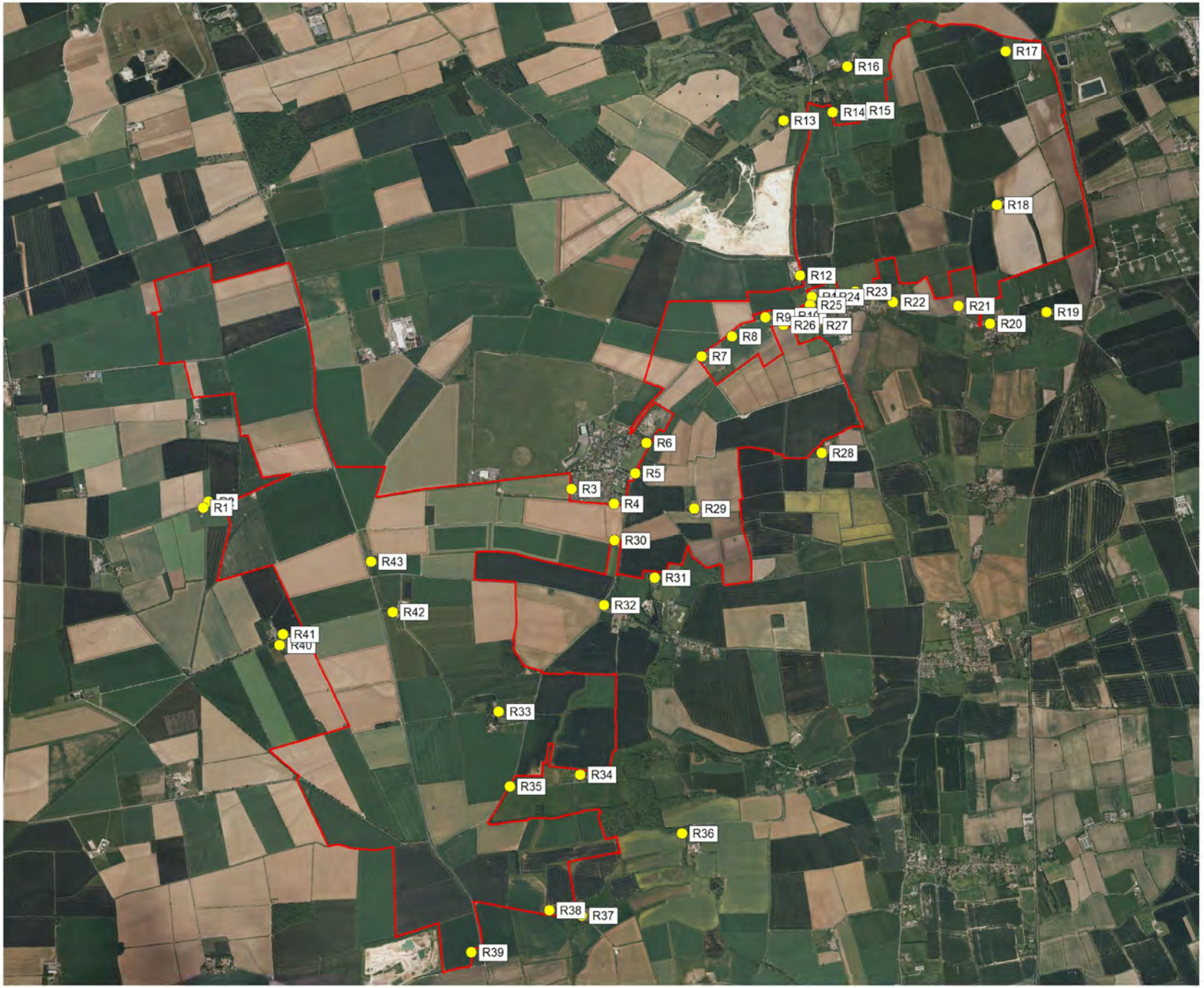
11.1

0 0.5 1 Kilometers

NOT TO SCALE

REV 00

Figure 11.2
Noise Receptor Locations



LEGEND:

- Site Boundary
- Sensitive Receptor

NOTES:

Nearest receptor locations to the Proposed Development (in noise terms)

Coordinate System: British National Grid Projection: Transverse Mercator Datum: OSGB 1936 Units: Meter

Rev	Date	Description	Drn	Chk	App
01	08/11/2023	Issued	JM	DC	DC
00	10/08/2023	First Draft	JM	DC	DC

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:

PEIR - Location Map

TITLE:

Sensitive Receptor Locations

FIGURE NUMBER:

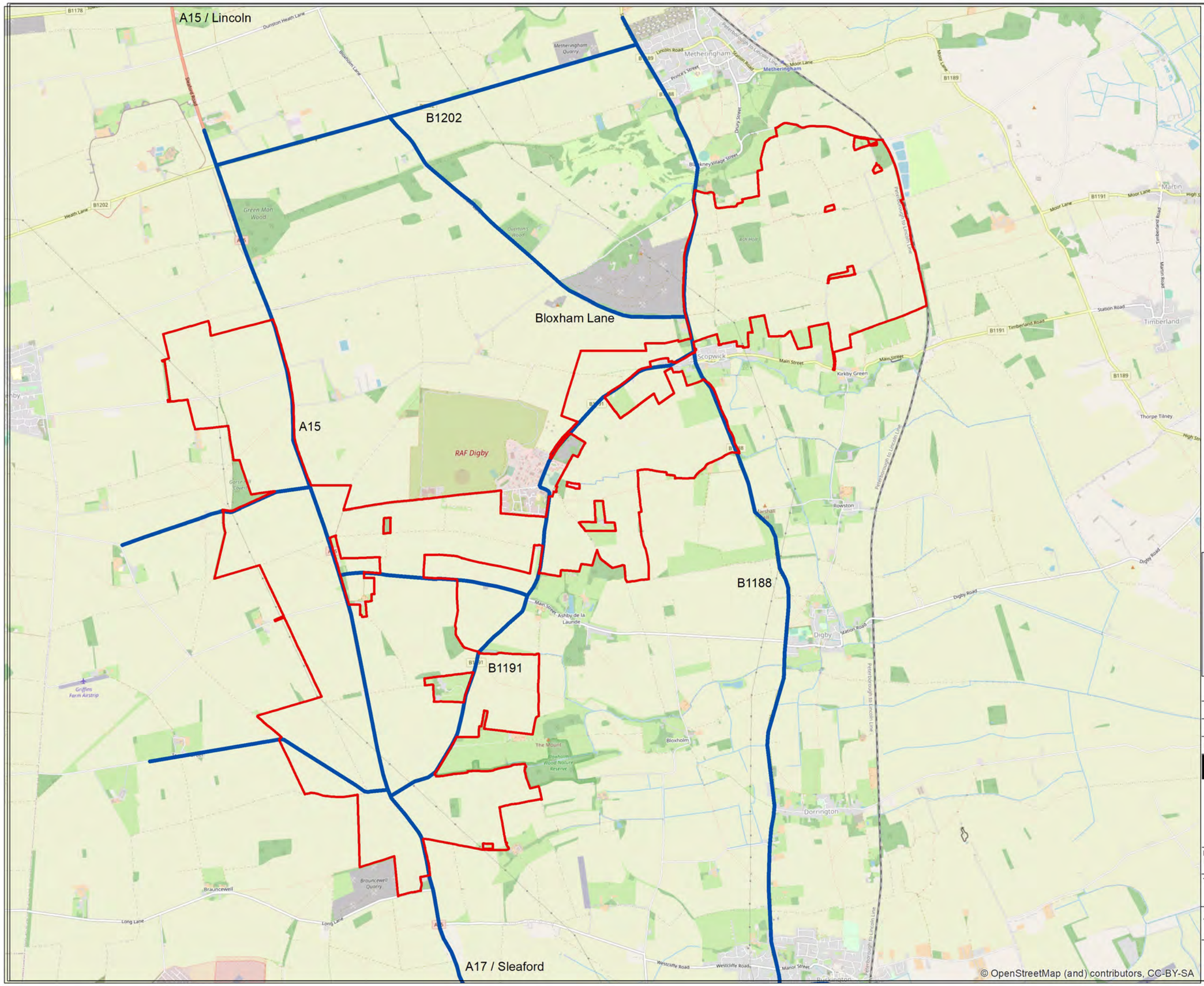
11.2

0 0.5 1 Kilometers

NOT TO SCALE

REV 00

Figure 12.1
Local Roads



LEGEND:

Site Boundary

NOTES:

Coordinate System: British National Grip Projection:
Transverse Mercator Datum: OGSB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	02/11/2023	PEIR Report	AT	AF	IW

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

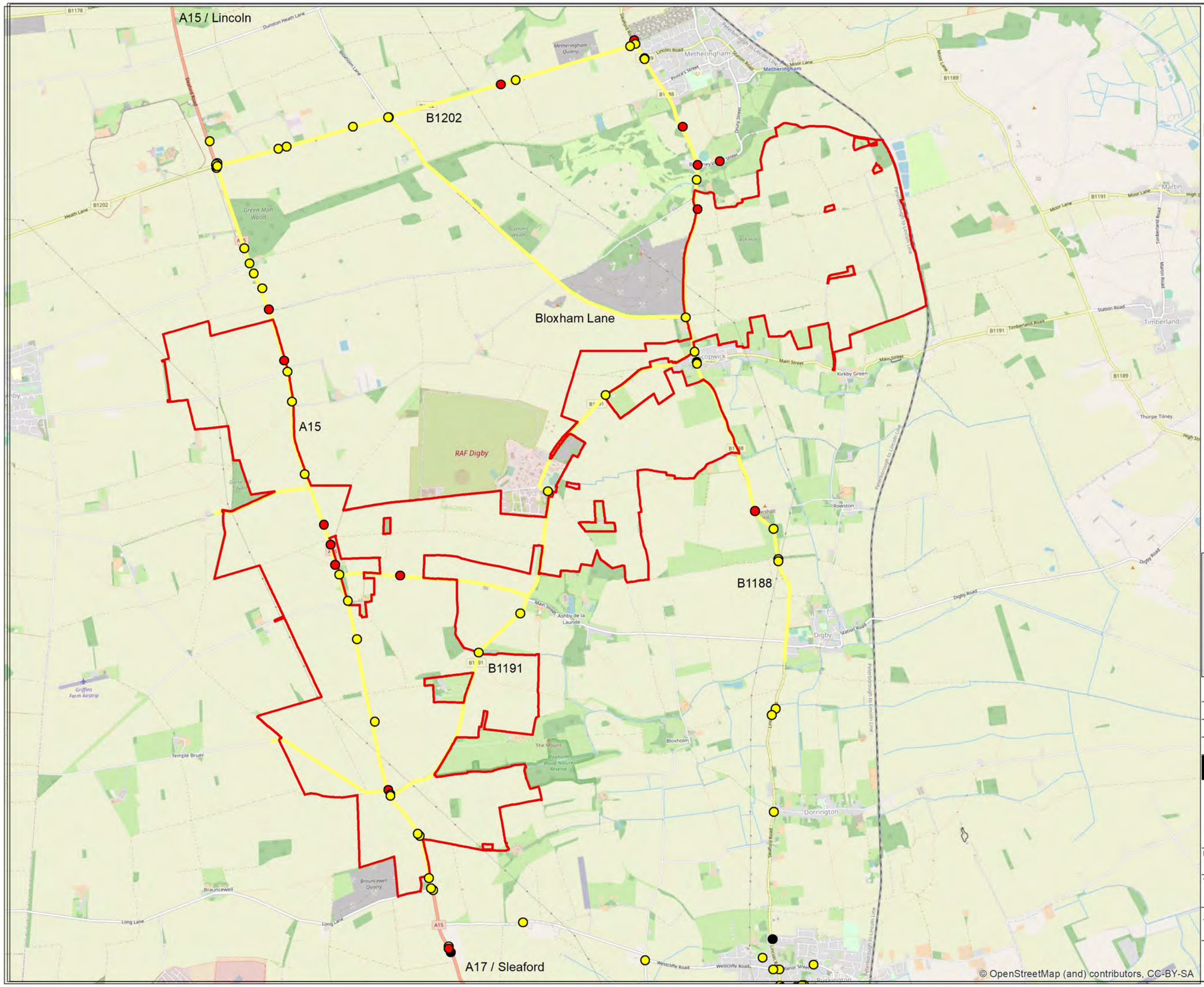
TITLE:
(T&T) Local Roads

FIGURE NUMBER:
12-1

0 200 400
Metres

REV 00

Figure 12.2
Accident Severity



LEGEND:

Accident Severity

- Fatal
- Serious
- Slight
- Site Boundary

NOTES:

Coordinate System: British National Grip Projection: Transverse Mercator Datum: OGSB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	02/11/2023	PEIR Report	AT	AF	IW

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
(T&T) Accident Severity

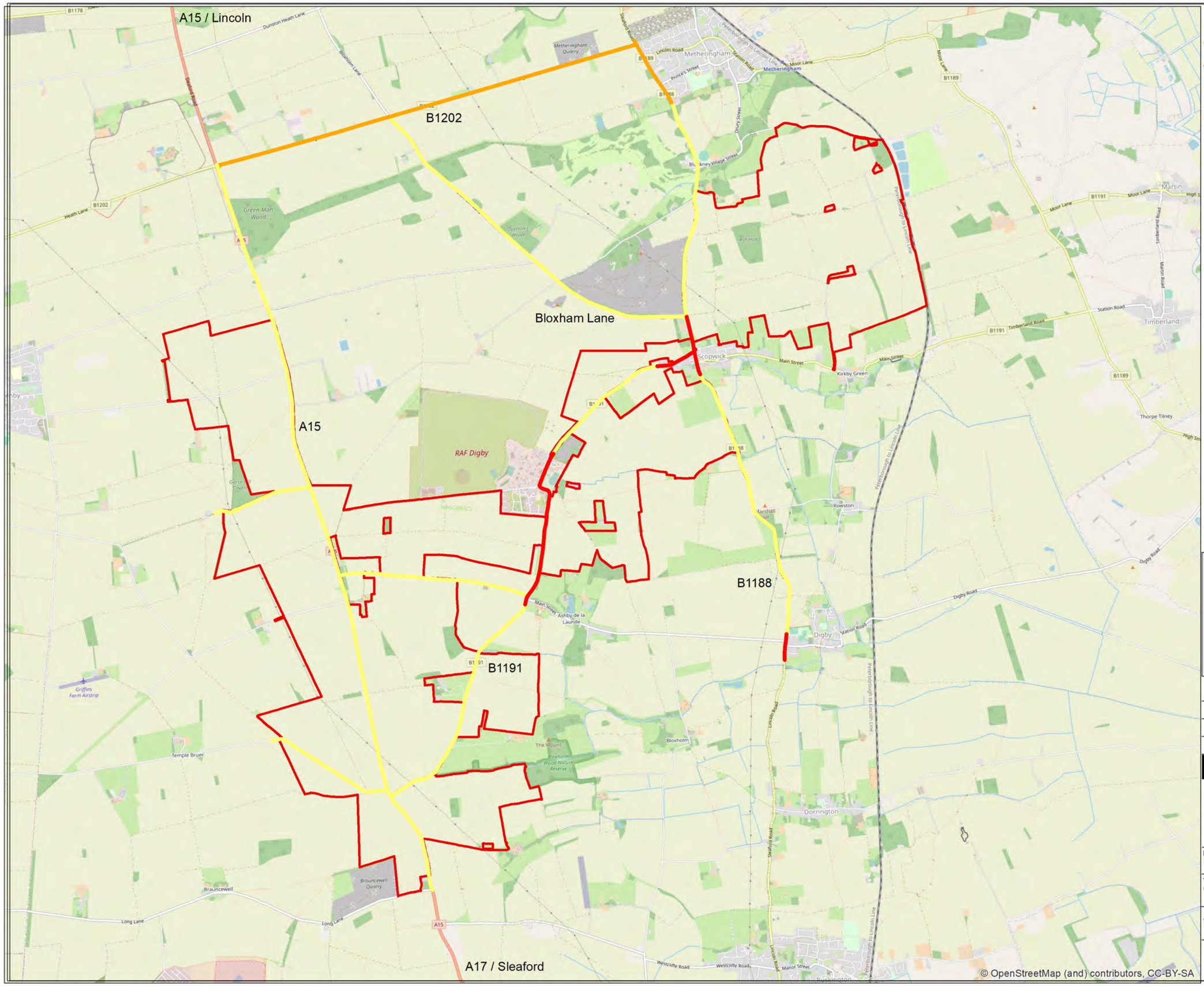
FIGURE NUMBER:
12-2

0 200 400
Metres

REV 00

Figure 12.3

Traffic and Transport Sensitive Receptors



LEGEND:

- Medium Sensitivity
- High Sensitivity
- Low Sensitivity
- Site Boundary

NOTES:

Coordinate System: British National Grip Projection: Transverse Mercator Datum: OGSB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	02/11/2023	PEIR Report	AT	AF	IW

Springwell Solar Farm

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
(T&T) Sensitive Receptors

FIGURE NUMBER:
12-3

0 200 400
Metres

REV 00

Figure 15.1
Cumulative Long-Listing Radius

LEGEND:

Site Boundary

NOTES:

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	31/10/2023	New RLB	FA	JG	DP
00	12/09/2022	First Draft	FA	JG	DP

Springwell Solar Farm

DOCUMENT:
PEIR

TITLE:
Cumulative Long List Radius

FIGURE NUMBER:

0 2 4
Kilometers
Scale: 1:120,000 @ A3

REV 01

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Springwell
Solar Farm

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Application Document Ref: EN010149/APP/5.2
Planning Inspectorate Scheme Ref: EN010149