



Mallard Pass

Solar Farm

Mallard Pass Solar Farm

Non Technical Summary

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1.0 Introduction

1.1 Overview

1.1.1 This document has been prepared on behalf of Mallard Pass Solar Farm Ltd (the 'Applicant') and provides a Non-Technical Summary (NTS) of the Environmental Statement (ES) **[EN010127/APP/6.1]** for the proposed Mallard Pass Solar Farm (the 'Proposed Development').

1.1.2 The Applicant has submitted an application for a Development Consent Order (DCO) to the Secretary of State for Business, Energy, and Industrial Strategy because the Proposed Development is classed as a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008, as its energy generating capacity exceeds 50MW.

1.2 What is the Mallard Pass Solar Farm Project?

1.2.1 The Proposed Development comprises the construction, operation and maintenance, and decommissioning of a solar photovoltaic (PV) array electricity generating facility with a total capacity exceeding 50 megawatts (MW) and export connection to the National Grid.

1.2.2 The area subject to the DCO Application comprises the Solar PV Site, the Grid Connection Corridor, the Onsite Substation, the Highways Works Site, and Mitigation and Enhancement Areas of which the principal components comprise the following:

- a. PV modules;
- b. Mounting Structures;
- c. Inverters;
- d. Transformers;
- e. Switchgear;
- f. Primary Onsite Substation and Ancillary Buildings;

- g. Low Voltage Distribution Cables;
- h. Grid Connection Cables;
- i. Fencing, security and ancillary infrastructure;
- j. Access tracks; and
- k. Green infrastructure (GI).

1.2.3 The location of the Proposed Development is shown on Figure 1 at the end of this NTS.

1.3 The Applicant

1.3.1 Mallard Pass Solar Farm Limited is a subsidiary of Windel Energy Limited.

1.3.2 Windel Energy Ltd, founded in 2018, is a privately held company that specialises in the development and asset management of renewable energy projects and low carbon, including solar, battery energy storage systems, onshore wind and green hydrogen technologies with projects ranging from 10MW to 320MW output across England and Wales. Windel Energy Ltd work closely with landowners, giving them the opportunity to diversify their income stream by leasing their land for solar development.

1.3.3 Canadian Solar Inc is the development partner of Windel Energy Ltd. It was founded in 2001 in Canada and is one of the world's largest solar power companies. It is a leading manufacturer of PV modules and provider of solar energy solutions and has a geographically diversified pipeline of utility-scale solar power projects in various stages of development. Over the past 19 years, Canadian Solar Inc has successfully delivered over 49 GW of premium-quality, solar PV modules to customers in over 150 countries.

1.4 Purpose of the NTS

1.4.1 The purpose of this NTS is to describe the Proposed Development and to provide a summary in non-technical language, of the key findings of the ES.

1.5 EIA Process Overview

1.5.1 **Chapter 2: Overview of the EIA Process** of the ES provides a summary of the Environmental Impact Assessment (EIA) process and assessment methodology. The purpose of EIA is to ensure that the likely significant environmental effects of the Proposed Development are understood and properly taken into account when decision-makers consider an application for development consent.

1.5.2 The EIA process is designed to produce an environmentally sensitive development by considering and assessing the effects of the Proposed Development against existing environmental baseline conditions. At the outset of the project, the EIA team undertook a review of the Order limits in order to identify potential environmental sensitive receptors.

1.5.3 This initial study was used to inform the Stage 1 Concept Masterplan of the Proposed Development which was presented within the non-statutory consultation exercise undertaken in November 2021.

1.5.4 Further design, consultation and assessment was then undertaken following the conclusion of the non-statutory consultation which informed the design and information presented in the Preliminary Environmental Information Report (PEIR).

1.5.5 Following the publication of the PEIR as part of the Stage 2 Consultation, the next stage of the EIA process was to undertake further assessment

work/modelling, informed by the Stage 2 Consultation feedback, further baseline survey information and the refinement of the design in order to present the likely significant effects that might arise as a result of the Proposed Development within the ES.

1.6 EIA Scoping

- 1.6.1 EIA Scoping is a stage within the EIA process that is used to identify issues to be considered within the ES and establish the scope of the assessment. Although scoping is not a mandatory requirement under the EIA Regulations, it is recognised as a useful preliminary procedure which helps to identify the main effects that a proposed development is likely to have on the environment.
- 1.6.2 Following the non-statutory consultation, the Applicant submitted an EIA Scoping Report and a request for an EIA Scoping Opinion under Regulation 10 of the EIA Regulations to the Planning Inspectorate in February 2022. The EIA Scoping Report (**Appendix 2.1** of the ES **[EN010127/APP/6.2]**) was developed with reference to standard guidance and best practice and was informed by the EIA team's experience working on several other similar projects.
- 1.6.3 The Scoping Opinion was received from the Planning Inspectorate in March 2022 and is presented within ES (**Appendix 2.2** of the ES). The matters raised have been reviewed and taken into consideration in the relevant technical assessments.
- ## **1.7 Preliminary Environmental Information Report**
- 1.7.1 The PEIR was prepared and published in May 2022 as part of the statutory consultation exercise undertaken by the Applicant. The purpose of the PEIR was to enable the local community to understand the environmental effects of the Proposed Development so as to inform their responses

regarding the Proposed Development' (Planning Inspectorate, Planning Advice Note 7 [1] It was also prepared to meet the requirements of Regulation 12(2) of the EIA Regulations [Ref 2].

- 1.7.2 The PEIR provided the preliminary findings of the environmental assessment undertaken at that time in the Proposed Development design development. Upon completion of the PEIR, the various assessments were at differing stages of completion due to ongoing design work and continued collection of baseline information.
- 1.7.3 The PEIR has been further developed following completion of the design work and environmental assessment and has been used to inform the ES, which this NTS summarises.

1.8 Environmental Statement

- 1.8.1 The ES [EN010127/APP/6.1] has been produced to accompany the Application, as required by the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ("the EIA Regulations") [Ref 3] in order to ensure that the Examining Authority (who considers the Application), and the Secretary of State (who makes the ultimate decision as to whether consent should be granted for the Proposed Development) are aware of the likely significant effects on the environment as a result of the Proposed Development when taking their decision. The ES complies with all the elements of Schedule 4 of the EIA Regulations.

The Order limits and Environmental Context

- 1.8.2 **Chapter 3: Order limits Description** of the ES provides a description of the Order limits. The Order limits is a term that is used to describe the land required to deliver the components of the Proposed Development.
- 1.8.3 The Order limits, as shown on Figure 1, comprises broadly of four different areas, which are broadly defined below:
- a. The Solar PV Site — areas within the Order limits that are proposed for solar development, the Onsite Substation and associated infrastructure;
 - b. Mitigation and Enhancement Areas – areas within the Order limits that are proposed for landscape screening, habitat creation and provision of permissive paths;
 - c. Highway Works Site - areas beyond the Solar PV Site which are proposed for cable route connections and temporary/permanent improvements to existing highways to facilitate the construction, operation and maintenance, and decommissioning of the Proposed Development; and
 - d. Grid Connection Corridor — area within the Order limits that are proposed for the Grid Connection Cable between the Onsite Substation and the National Grid Ryhall Substation and the new connection at National Grid Ryhall Substation.
- 1.8.4 The extents of the Solar PV Site, Mitigation and Enhancement Areas, Highway Works Site and the Grid Connection Corridor are shown on Figure 2.
- 1.8.5 The Order limits equate to approximately 852ha, with approximately 524ha of the Order limits lying within RCC's administrative boundary and the

remaining 327ha of the Order limits lying within SKDC's administrative boundary.

- 1.8.6 The Grantham - Peterborough (East Coast Main Line) railway line dissects the Order limits on a general north-west to south-east alignment. The Solar PV Site is located to the immediate south, east and west of Essendine and approximately 700m north-east of Ryhall. The north-eastern most edge of Stamford is located approximately 1.4km south-west of the Solar PV Site at its nearest point. The centre of Peterborough is located approximately 16km south-east of the Solar PV Site.
- 1.8.7 The Solar PV Site and Mitigation and Enhancement Areas are, for the purposes of the EIA process, subdivided into a series of numbered fields. The plan showing the field number system is provided at Figure 3.
- 1.8.8 The Solar PV Site comprises 54 agricultural fields. Hedges, trees and woodland form the boundaries to the fields within the Solar PV Site. There is a requirement for highways works between the Strategic Road Network (SRN) and the Order limits to facilitate construction traffic access.
- 1.8.9 The field numbering system was created earlier in the evolution of the Proposed Development, and due to design changes, to fields were removed from the Order limits. These are fields 23 and 38. The rest of the fields were not renumbered in order to retain the consistency of referencing throughout the ES and supporting documents.

Access

- 1.8.10 The A6121, which connects Ryhall, Essendine and Carlby, separates the north-western extent of the Solar PV Site from the remainder, routing on a general north-east to south-west alignment. The A6121 provides connection to the A1 via Stamford to the south-west of the Order limits and

to the A15 via Bourne to the north-east of the Order limits. The B1176 segments the north-westernmost extent of the Solar PV Site and is routed on a general north-south direction between Little Bytham to the north and Ryhall to the south. The B1176 connects to the A6121 at Ryhall.

- 1.8.11 There are five Public Rights of Way (PRoW) which cross the Solar PV Site and Mitigation and Enhancement Areas. The Macmillan Way recreational route follows the south-western boundary before crossing the south-central area and continues along the northern boundary of the south-western extent of the Solar PV Site.

Water Resources

- 1.8.12 The West Glen River (Environment Agency Waterbody ID: GB105031055510) runs through the Order limits on a general north-west to south-east alignment. A network of drains, ditches and streams, which follow field boundaries, are also present across the Solar PV Site and Mitigation and Enhancement Areas. A small pond is located within the central-eastern area of the Solar PV Site (Field 31). The Order limits are predominantly located within an area of very low risk from surface water flooding.

Agricultural Land

- 1.8.13 An Agricultural Land Classification (ALC) survey shows that the Solar PV Site and Mitigation and Enhancement Areas are predominantly made up of Grade 3b land (non Best and Most Versatile (BMV)), with smaller parcels of Grade 3a and Grade 2.

Ecology and biodiversity

- 1.8.14 The Solar PV Site and Mitigation and Enhancement Areas comprise predominantly arable agricultural land, a network of hedgerows, drains and

ditches and blocks of woodland. Areas of improved grassland, species poor semi-improved grassland, semi-improved neutral grassland, tall ruderal vegetation, and scrub are also present. Ancient woodland is also present offsite, adjacent to the to the northern, southern and north-western Order limits boundaries.

1.8.15 There are four internationally designated sites and eight nationally designated sites within 10km of the Order limits, including: Ryhall Pasture and Little Warren Verges SSSI, Newell Wood SSSI, the Rutland Water SPA and Ramsar site.

1.8.16 A total of 71 Local Wildlife Sites are present within 2km of the Order limits. The majority of these are designated for habitats (predominantly hedgerows, grassland and woodland) with many also featuring locally or nationally scarce.

Cultural heritage

1.8.17 The Order limits is not subject to any statutory heritage designations.

1.8.18 There is one Scheduled Monument within proximity of the Solar PV Site, Essendine Castle, along with the Grade II* Listed Building Church of St Mary, which are located approximately 300m west the Solar PV Site boundary. A total of approximately forty designated heritage assets are located within a 1km study area around the Solar PV Site and Mitigation and Enhancement Areas.

Air Quality

1.8.19 The Order limits are located approximately 23km to the south-east of the nearest Air Quality Management Area (AQMA) declared for concentrations of nitrogen dioxide (NO₂).

Ground conditions

- 1.8.20 British Geological Survey (BGS) mapping indicates that the Solar PV Site is underlain by sedimentary rocks of the Inferior Oolite Group to the north-west, overlain by the Great Oolite Group in the centre, which is overlain by Ancholme Group to the south-west.

2.0 Alternatives and Design Development

2.1 Introduction

- 2.1.1 **Chapter 4: Alternatives and Design Development** of the ES provides the alternatives considered and the design evolution of the Proposed Development. Considering the policy and legal requirements as well as the iterative approach to the design to date and feedback from the non-formal consultation undertaken in November 2021, the following alternatives have been considered for the Proposed Development and discussed in this chapter:

- a. Alternative sites, size and scale;
- b. Alternative technologies; and
- c. Alternative layouts.

- 2.1.2 The consideration of 'no development' as an alternative to the Proposed Development has not been considered as a reasonable alternative as it would not deliver the proposed renewable electricity generation capacity which is required in order to meet the UK's net zero targets.

2.2 Alternatives Considered

- 2.2.1 There are several reasons why the land within the Order limits was selected and why it is considered suitable for a large scale solar farm, including:

- a. The land within Lincolnshire has the potential to locate a large-scale solar development. This is due to the existence of large open areas of undeveloped land, which is predominantly made up of gently undulating topography and generally sparse settlement patterns. This region also has high levels of Solar Irradiation;
- b. There is the available capacity for the Proposed Development to connect to the national grid system at Ryhall National Grid Substation, making efficient use of existing infrastructure which means the Proposed Development can be completed in reasonable time and cost;
- c. There is a short grid connection route between the Order limit and the existing Ryhall substation;
- d. The land is not located within or close to internationally and nationally designated biodiversity sites;
- e. The development avoids the use of large areas of BMV land;
- f. The land is not located within or close to Areas of Outstanding Natural Beauty or designated areas of landscape value;
- g. The land is not located within a Green Belt Designation;
- h. The Project can avoid direct physical impact on designated heritage assets;
- i. The land is predominantly within Environment Agency Flood Zone 1, therefore, at a low risk of flooding (less than 0.1% annual probability of river or sea flooding);
- j. The land relatively close to part of the Strategic Road Network (SRN) by virtue of the A1 and has good accessibility via the rural road network for construction; operational maintenances; and decommissioning;
- k. There are relatively few residential properties in immediate proximity to the Order limits; and

- I. The site has limited land use conflict with respect to local development plan allocations and displacement of existing businesses.

2.2.2 In summary, the availability of significant capacity at the Ryhall substation without the need for upgrading was the primary driver in identifying a site in this part of Lincolnshire. 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.

2.2.3 The Order limits is considered to be preferable compared to possible alternative areas further away from the Ryhall Substation for a number of reasons including the lack of availability of suitable and available previously developed land, relative distance from protected ecological and heritage assets (including Rutland Water SPA) compared to areas further west and south and comparably favourable ALC with limited levels of Grade 3a and 2 land. The Order limits is also well located in relation to the SRN, which will help to reduce the effects during construction.

Alternative Renewable Technologies

2.2.4 Tidal power, offshore wind, and hydroelectric storage were not considered possible due to the location of the Ryhall Substation approximately 48km from the coast, and within an area of low, flat topography.

2.2.5 The Order limits is not considered suitable for onshore wind due to the low wind yield relative to other parts of the UK, coupled with the proximity to residential dwellings which would be subject to risks associated with shadow flicker and wind turbine noise. It is not expected that the Order limits would have been able to host an economically viable and successful onshore wind farm without causing greater environmental consequences than the Proposed Development.

2.2.6 Nuclear power was not considered as an alternative due to the high costs of electricity.

2.2.7 It is therefore considered that Solar Farm development is the best renewable generating solution for the Order limits.

Alternative Solar Technologies / Layouts

2.2.8 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. Notwithstanding this, technological design options have been considered and discounted. The main reasons for discounting the technological options are set out below:

Solar PV Configuration

2.2.9 East / West Solar PV Configuration – An East / West configuration was discounted because, in comparison to the Fixed South Facing or Single Access Tracking, this configuration reduces the potential to deliver biodiversity gain and / or utilise the space between the panels for grazing. The level of light reaching the ground beneath the panels would be significantly reduced due to the density and compactness of the east / west configuration. An East / West configuration over the same area would generate an increased number of the heavy goods vehicle (HGV) movements than Fixed South Facing or Single Access Tracking the East / West configuration allows for a greater number of modules to be installed per unit area.

Alternative Grid Connection Routes

2.2.10 No alternative grid connection corridors have been considered by the Applicant given the close proximity between the Onsite Primary Substation and National Grid Ryhall Substation.

Alternative Layouts

- 2.2.11 The layout of the Proposed Development has evolved iteratively taking into consideration the NPS, objectives of the Proposed Development, environmental effects, and feedback from stakeholders during the statutory consultation process.
- 2.2.12 The layout and extents of the Order limits and Solar PV Site has undergone several stages of design evolution aligned with key stages of consultation/the DCO process:
- a. Stage 1 – Non-Statutory Consultation
 - b. Stage 2 – Statutory Consultation (PEIR Layout)
 - c. Stage 3 – DCO Application

Stage 1 – Non-Statutory Consultation

- 2.2.13 The initial Order limits area totalled approximately 880ha as shown on Figure 1. All available land within this boundary was then subject to an initial appraisal to identify suitability for solar PV development (i.e. to potentially accommodate solar PV arrays or enabling). The appraisal focused on the suitability of land parcels within the identified boundary for development, based on environmental, social and economic factors which are also reflected in the NPS. No designed layout was considered at this stage. However, minimum offsets to landscape and ecological features and designations were applied to inform the process. Following the initial appraisal, which included site visits and desktop analysis, identified areas within the Solar PV Site considered not suitable for accommodating solar PV arrays were removed for the following reasons:

- a. Setting of Essendine – the extent of solar development was pulled back and away from the settlement boundary of Essendine to reduce potential landscape and visual impacts as well as impacts to the setting of Essendine Castle Scheduled Monument.
- b. Setting of Braceborough – The land to the east of the Order limits was removed because of the potential impacts on the landscape character and the proximity to the Braceborough conservation area.
- c. Braceborough Great Wood – the fields located to the north of Carlby Road due to their proximity to the ancient woodland and the existing PRoW that traverse through the centre of the fields.
- d. Burghley House – Two fields in the south-west of the Order limits were removed due to the potential theoretical visibility from Burghley House as the two fields are located on land that slopes towards the River Welland valley and Burghley House to the south.
- e. Little Warren Wood and Ryhall Pastures and Little Warren Verges SSSI – An opportunity was identified to improve connectivity between Little Warren Wood and Ryhall Pastures and Little Warren Verges SSSI. The extents of solar infrastructure was set back from the northern boundary to reflect the offset to arable on the northern side of the ditch that runs through this part of the Order limits. This area will be used to improve green infrastructure connectivity with the SSSI, which is located outside of the Order limits.
- f. Onsite substation – the location of the Onsite Substation was chosen due to its proximity to the existing National Grid Ryhall Substation, minimising the disruption of the export cable route. The location is also separated from Essendine by the East Coast Mainline, and other clusters of properties and public rights of way.

- g. Retention of existing green infrastructure features – an early design principle was to retain all existing woodland blocks, hedgerows and ditches within the Order limits so to reduce potential impacts on protected species and integrate the layout into the fabric of the existing landscape pattern and character.

2.2.14 Following removal of the areas described above, the remaining area that could potentially accommodate Solar PV arrays was approximately 570ha. The removed areas were retained in the Order limits as Mitigation and Enhancement Areas to potentially provide ecological mitigation and green infrastructure for example, areas for existing habitats, new planting, access and routes for Low Voltage Distribution Cables.

Stage 2 – PEIR Layout

2.2.15 Following informal consultation in November 2021, the Stage 1 masterplan was reviewed and the following changes made:

- a. Grade 2 Agricultural Land – following the completion of the agricultural land classification survey, fields that were identified as consisting entirely of Grade 2 land have been removed from solar development.
- b. Residential Amenity – Following feedback from the Stage 1 consultation and further Site visits, areas of the Solar PV Site were removed due a combination of potential residential amenity impacts and landscape and visual impacts. The extent of removal was reviewed at each individual location, with a suitable set back reflecting existing or historic landscape boundaries or features.
- c. West Glen River – Areas for potential solar development were removed along the West Glen River corridor in order to remove the majority of PV Arrays from the flood plain. This has also provided the opportunity

to reduce any potential impacts on protected species using the river corridor and provide ecological habitat enhancement.

- d. Access Strategy – the access strategy was consolidated so to use one point of access rather than use multiple access points.

2.2.16 After the removal of the areas described above the proposed area for PV Arrays was approximately 463ha (see Figure 1). The removed areas were retained in the Order limits as Mitigation and Enhancement Areas to potentially provide ecological mitigation, green infrastructure opportunities, access and routes for Low Voltage Distribution Cables.

Stage 3 – DCO Application

2.2.17 Following the Statutory Consultation, the Stage 2 masterplan was reviewed in light of the comments received from stakeholders and further analysis of baseline information. The following changes were made to the Proposed Development:

- a. PV Arrays removed from the eastern extents of Field 3.
- b. PV Arrays removed from the western extents of Fields 27 and 29. The removal of panels in this location has sought to reduce the visual and amenity impact from Essendine and those travelling along the A6121.
- c. PV Arrays removed from the eastern extent of Field 18 to increase the set back from the permissive path and reduce the impact of users of the permissive path.
- d. PV Arrays removed from the northern extents of Field 12.
- e. PV Arrays removed from Field 23 as there is an overhead utility line located within this field.
- f. The network of permissive paths within the Order limits was extended as follows;

- g. a new circular route to the east of Essendine that doesn't require users to travel along Carlby Road;
- h. an extension of the permissive path along the western bank of the West Glen River within Field 7 to the north of Essendine;
- i. New section of permissive path within Field 9, to provide an offroad connection between the Drift.
- j. Two new east-west Green Infrastructure corridors have been incorporated within Fields 31 and 35.
- k. Additional tree belts and hedgerows have been incorporated into the Green Infrastructure Strategy including:
 - l. A tree belt along the northern boundary of Field 18 to reduce the visual impacts of the PV Arrays and Onsite Substation from Essendine;
 - m. A tree belt along the south-eastern boundary of Field 50 to improve connectivity between the tree belt along the southern boundary of Field 50 and the existing block of trees; and
 - n. A new hedgerow along the western extents of Field 45.
- o. Field 38 was removed from the Order Limits as it is not suitable for skylark mitigation.
- p. The majority of The Drift has been removed from the Order Limits, avoiding direct impacts on the Local Wildlife Site.
- q. Areas of Ryhall Pasture and Little Warren Verges SSSI have been removed from the Order Limits.
- r. An alternative vehicular crossing between Fields 25 and 49 has been included to provide optionality with regards to internal construction and operational vehicular routing.
- s. Sections of the A6121 and Ryhall Road have been removed from the Order Limits, avoiding direct impacts on the Tolethorpe Verges SSSI.

- t. A number of local roads have been removed from the Order Limits as they are no longer required for access or cable routing.
- u. The height has been reduced of a number of elements of the Onsite Substation, reducing the visual impact on receptors located at Essendine.

2.3 Proposed Development Description

Introduction

2.3.1 **Chapter 5: Project Description** of the ES provides a description of the Proposed Development. The physical characteristics of the Proposed Development are described alongside the proposed construction, operation and decommissioning activities that have informed each of the technical assessments included in the ES.

2.3.2 The principal components of the Proposed Development comprise the following:

- a. PV modules;
- b. Mounting Structures;
- c. Inverters;
- d. Transformers;
- e. Switchgear;
- f. Onsite Substation and Ancillary Buildings;
- g. Low Voltage Distribution Cables;
- h. Grid Connection Cables;
- i. Fencing, security and ancillary infrastructure;
- j. Access tracks; and
- k. Green infrastructure (GI).

2.3.3 An illustrative layout, which shows the areas that are being considered for the potential solar development, the substation and areas for mitigation and enhancement, is provided at Figure 2.

2.4 Scheme Design

2.4.1 The design of the Proposed Development has been an iterative process, based on preliminary environmental assessments and consultation with statutory and non-statutory consultees.

2.4.2 It is important to note that the exact design details will not be confirmed until the tendering process; this is to allow for flexibility to accommodate changes in technological advancements. The Rochdale Envelope approach will be adopted by specifying parameter ranges for the assessment, with the ES assessing the ‘worst case’ scenario.

2.4.3 The following sections provide a description of the different elements of the Proposed Development. Each environmental topic has assessed the design considered to be the likely worst-case scenario for that discipline to determine the potential for significant effects and identify suitable mitigation measures.

2.4.4 The Proposed Development is also described in Schedule 1 of the Draft DCO where the “authorised development” is divided into works packages. The works numbers for those packages are identified below and are referred to throughout this ES. Note that there is overlap of Work Areas in some locations, and so the sum of the Order limits is not the total of these areas:

- a. Work No. 1: A ground mounted Solar Photovoltaic Generating Station;
- b. Work No 2: Onsite Substation;

- c. Work No 3: Grid Connection Route (Work No 3A) including access tracks (Work No 3Aii) and temporary construction laydown areas (Work No. 3B);
- d. Work No. 4: Electrical cables and communication cables connecting to Work 1 and Work 2;
- e. Work No. 5: temporary construction and decommissioning laydown areas;
- f. Work No. 6: works to facilitate access to Works Areas 1 to 5; and
- g. Work No. 7: works to create, enhance and maintain green Infrastructure.

2.4.5 The DCO also allows for the following works to take place within each and all of the works areas referred to above. This has been taken into account in the assessments undertaken in this Environmental Statement:

- a. fencing, gates and boundary treatment;
- b. drainage;
- c. security and monitoring measures such as CCTV columns, lighting columns and lighting, cameras, lightning protection masts;
- d. improvement, maintenance and use of existing tracks
- e. new internal access tracks, signage and information boards;
- f. permissive paths
- g. temporary footpath diversions;
- h. landscaping;
- i. earthworks.

2.5 Work No. 1

PV Modules and Arrays

2.5.1 The Proposed Development would consist of PV Modules placed on Mounting Structures arranged in rows (known as PV Tables). A group of PV Modules that connected to one another are known as 'PV Strings'. There are two options for the mounting structures which have been considered and assessed:

- a. Fixed South Facing (FSF) Arrays; and
- b. Single Axis Tracker (SAT) Arrays.

PV Module Mounting Structures

2.5.2 The frames upon which the PV Modules will be mounted will be pile driven or screw mounted into the ground to a maximum depth of 2.5m, subject to ground conditions. The option to install concrete blocks known as "shoes" may also be considered, avoiding the need for driven and screw anchored installation, therefore minimising ground disturbance. The mounting frames would likely be made of either anodised aluminium alloy or galvanised steel and would have a rough matt finish.

Inverters

2.5.3 Inverters are required to convert the DC electricity collected by the PV Modules into alternating current (AC) which allows the electricity generated by the PV Modules to be exported to the National Grid.

2.5.4 There are two options for inverters:

- a. String Inverters - small enough to be mounted to the Mounting Structures underneath the PV Modules; or

- b. Central Container Inverter - typically be housed within a container or cabinet up to 3.2m in height

Transformers

- 2.5.5 Transformers are required to step up the voltage of the electricity generated by the PV Modules before it reaches the Primary Onsite Substation. Transformers are typically housed indoors within a container (either within the Central Container Inverter or a String Transformer container), and will be distributed throughout the Solar PV Site.
- 2.5.6 The height of the String Transformers will typically be up to 3m in height. Transformer cabins are typically externally finished in keeping with the prevailing surrounding environment, often utilising a green painted finish.

Switchgears

- 2.5.7 Switchgears are the combination of electrical disconnect switches, fuses or circuit breakers used 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.
- 2.5.8 Switchgears are typically housed indoors within a container and up to 3.2m in height.

2.6 Works No 2

Onsite Substation and Ancillary Buildings

- 2.6.1 There will be a new single Onsite Substation (400/33KV) located near the National Grid Ryhall Substation. The Onsite Substation will comprise electrical infrastructure such as the transformers, switchgear Control Buildings, and metering equipment required to facilitate the export of electricity from the Proposed Development to the National Grid. The Onsite

Substation will also include Ancillary Buildings which will include office space and welfare facilities as well as operational monitoring and maintenance equipment. The size of the substation compound is 100m x 200m, with a maximum height parameter being 13m that allows for the Onsite Substation and associated electrical control buildings & workshop buildings and construction site office, storage and welfare building.

2.7 Works No 3

Grid Connection Corridor

2.7.1 The electricity generated by the Proposed Development is to be exported via a 400kV connection between the Onsite Substation and the National Grid Ryhall substation at Uffington Lane which is a National Grid Electricity Transmission (NGET) substation. The grid connection cables will comprise three 400kV cables buried within a trench, up to 2m in depth. The cable connection route is expected to cross under Uffington Lane and run alongside the existing access track to the National Grid Ryhall Substation.

2.8 Works No 4

Electrical Cables

2.8.1 Low Voltage Distribution Cabling between PV Modules and the String Inverters will typically be located above ground level (along a row of PV Tables), fixed to the Mounting Structure, and then trenched underground between the PV Tables and String Transformer or Central Container Inverter (subject to which technology is chosen). Higher rated voltage cables (33kV) are required between the transformers and the Primary Onsite Substation. The 33kV cables will be buried underground in a trench. The routing of these cables has not yet been finalised, but it is anticipated that the 33kV cables will run alongside the internal access tracks to the access point onto the adopted highway. From that point the cables would

either run within the adopted highway or would cross the adopted highway and run within the extents of the Solar PV Site or Mitigation and Enhancement Areas back to the Onsite Primary Substation. The indicative locations of the crossing points over the adopted highway are shown on Figure 3.

- 2.8.2 Data cables will be required to allow for the monitoring during operation, such as the collection of data on the power of the sun. The data cables would typically be installed within the same trench and alongside the electrical cables.
- 2.8.3 The existing above and below ground utilities across the Solar PV Site are not proposed to be altered by the Proposed Development.
- 2.8.4 Onsite cabling will be required to connect the PV Arrays located to the east of the East Coast Main Line to the Primary Onsite Substation which is located to the west of the East Coast Main Line. Three cable routes / methods are being considered, the location of which are shown on Figure 4:
- a. Option 1 - cables would be run through the existing brick culverts underneath the East-Coast mainline;
 - b. Option 2 - Horizontal directional drilling (HDD) underneath the East Coast mainline; or
 - c. Option 3 - cables to be routed within the adopted highway along the A6121 and Uffington Lane.

2.9 Work No.5

Temporary Construction Compound

2.9.1 During the construction phase, a primary construction compound will be located onsite with temporary secondary construction compound(s) provided at different locations throughout the Solar PV Site. The locations of the primary and secondary construction compounds are shown on Figure 5.

2.10 Work No 6

Highways Works

2.10.1 The primary point of access to the Solar PV Site will be from Uffington Lane, opposite the existing access to the National Grid Ryhall Substation, with vehicles approaching from the A6121 Stamford Road to the north. This point of access would provide access to the Onsite Substation and Ancillary Buildings and the primary construction compound.

2.10.2 Up to eight secondary points of access to the Solar Arrays have been identified in order to access the Solar PV Site. These secondary access points, along with a network of internal access tracks, will provide operational access to the Solar Arrays and associated infrastructure for the purposes of management and maintenance.

2.10.3 The primary and secondary points of access will be taken from existing agricultural tracks and field entrances, with the exception of the new point of access along the B1176, Carlby Road and Main Street (leading to Carlby).

2.11 Works No 7

Green Infrastructure

- 2.11.1 The existing hedgerows, woodland, ditches, ponds and field margins will be retained, with the exception of small breaks and/or crossings required for new access tracks, security fencing and cable routes. The PV Arrays and associated security fencing have been set back from existing hedges by 10m and 15m from woodland. The access tracks and cable routes will be designed to use existing agricultural gateways/tracks between the fields where possible.
- 2.11.2 The existing Public Rights of Way (ProW) that cross the Solar PV Site and Ecological Mitigation an Enhancement Areas will be retained and incorporated within multifunctional green corridors. Subject to the construction phasing and methodology there may be a requirement to temporarily divert a PRow for a period during the construction phase.
- 2.11.3 The Mitigation and Enhancement Areas as identified on Figure 2 will provide areas for green infrastructure, including the creation of wildflower grassland adjacent to the West Glen River and along the small valley in the north-west of the Order limits. The majority of the existing arable fields within the Mitigation and Enhancement Areas will continued to be farmed under arable rotation with additional measures to support skylarks.

2.12 Works in Connection with and in addition to Work Nos. 1 to 7 Fencing, Security & Ancillary Infrastructure

- 2.12.1 A fence will enclose the operational area of the Proposed Development. The fence is likely to be a 'deer fence' and approximately 2m in height. Pole mounted internal facing closed circuit television (CCTV) systems

installed at a height of up to 3.5m are also likely to be deployed around the perimeter of the operational areas.

2.12.2 CCTV cameras would use night-vision technology, which would be monitored remotely and avoid the need for night-time lighting. No areas of the PV Arrays are proposed to be continuously lit. For security requirements, operational lighting would include Passive Infra-red Detector (PID) systems which would be installed around the perimeter of the Proposed Development.

2.12.3 The lighting of the Onsite Substation would be in accordance with Health and Safety requirements, particularly around any emergency exits where there would be lighting, similar to street lighting that operates from dusk. Otherwise, lighting sensors for security purposes will be implemented around the Onsite Substation.

Onsite Access Tracks

2.12.4 It is anticipated that onsite access tracks will follow the alignment of the existing agricultural tracks, where possible, limiting the requirement for new tracks and drainage ditch crossings, disturbance to soils and habitat removal. New internal access tracks will be up to 5m wide, passing bays will be provided along the internal access tracks.

2.13 Construction

Construction Programme

2.13.1 The construction phase is anticipated to take 24 months and subject to being granted consent the earliest construction is anticipated to start in Summer 2026. The final programme will be dependent on the final layout design and potential environmental constraints on the timing of construction activities.

Construction Activities

2.13.2 The indicative construction activities likely to be required as provided below:

- a. Site preparation;
- b. Solar PV Site construction;
- c. Testing and commissioning; and
- d. Reinstatement and habitat creation.

Construction Access

2.13.3 The construction access strategy will require construction vehicles to arrive from the Strategic Highway Network via Route 1 and depart to the Strategic Highway via Route 3. Routes 1 and 3 are described below:

- a. Route 1 proposes to access the Solar PV Site from the A1, which forms part of the SRN via the B1081 Old Great North Road, Ryhall Road, the A6121 Essendine Road and Uffington Road to the Onsite Construction Compound.
- b. Route 3 proposes to depart the Solar PV Site via Uffington Road, the A6121 Stamford Road, West Road, Raymond Mays Way (south of Bourne), A15 and the A47.

2.13.4 Previously considered Route 2 was discounted following the PEIR production.

2.13.5 It is anticipated that the construction phase will require an average of between 100 - 150 workers onsite with a maximum of up to 400 construction staff at the peak construction period.

2.14 Construction Reinstatement and Habitat Creation

2.14.1 A programme of landscape and habitat reinstatement and creation will commence during the construction phase. It is anticipated that areas under the PV Arrays and the landscape buffers will be planted with a combination of native grassland mix, wildflower mixes, scrub and hedgerows. Woodland blocks and belts will be planted in strategic locations to provide visual screening, ecological habitats in order to achieve a biodiversity net gain of 71%.

2.15 Environmental Management

2.15.1 The following management plans will be developed and prepared to be submitted to support the DCO Application:

- a. Outline Construction Environmental Management Plan (oCEMP);
- b. Outline Construction Traffic Management Plan (oCTMP) and Framework Travel Plan;
- c. Outline Operational Environmental Management Plan including an Outline Landscape Ecological Management Plan (oLEMP);
- d. Outline Excavated Materials management Plan;
- e. Outline Decommissioning Environmental Management Plan (oDEMP);
and
- f. Outline Skills, Supply Chain and Employment Management Plan

2.15.2 The management plans set out legislation, guidance, best practice guidance and the mitigation measures identified through the EIA process to be employed during construction phase, such as construction lighting avoiding ecological sensitive habitats. The outline management plans will form the framework for detailed management plans that will be agreed with local planning authorities prior to construction.

2.16 Operation

- 2.16.1 The operational life of the Proposed Development is not proposed to be specified in the application and the Applicant is not seeking a time limited consent. All of the technical assessments have been carried out on the basis that the Proposed Development is permanent.
- 2.16.2 It is anticipated that there would typically be up to four permanent staff onsite during the operational phase of the Proposed Development, with additional staff attending when required for maintenance, replacement of solar equipment and cleaning, up to a total of 20 staff per day.
- 2.16.3 The land underneath and around the PV Arrays could be managed through a combination of sheep grazing and/or hay/silage production, or mechanical maintenance in order to maintain the field vegetation during the operational phase of the Proposed Development.

2.17 Decommissioning

- 2.17.1 The Applicant is not seeking a time limited consent. The operational life of the Proposed Development will not be specified within the DCO Application. However, it is recognised that the electrical infrastructure will have an operational lifespan, after which it will need to be replaced or removed. For the purposes of the assessing decommissioning with the EIA, it has been assumed that the Proposed Development has a 40-year operational life span and decommissioning is anticipated to take approximately six to twelve months.
- 2.17.2 It is anticipated that all the solar infrastructure including PV modules, mounting structures, cabling, inverters, transformers, switchgear, fencing and ancillary infrastructure, and the Onsite Substation, would be removed and recycled or disposed of in accordance with good practice following the waste hierarchy, with materials being reused or recycled wherever

possible. All waste will be disposed of in accordance with the legislation at the time of decommissioning.

- 2.17.3 If the Proposed Development were to be decommissioned, the Solar PV Site would be reinstated in accordance with the DEMP. The Solar PV Site would be reinstated, so far as possible, to its original use after decommissioning including the removal of any permissive paths and potential reversion of grassland underneath the PV Arrays to arable land. Any landscape structural planting, such as tree planting, hedgerows, scrub etc created to deliver biodiversity mitigation and enhancement would be left in-situ when the Site is handed back to the landowners.

3.0 **Assessing Environmental Effects**

- 3.1.1 **Chapters 1 to 5** of the ES provide an introduction to the policy and legislative context, a description of the Order limits and surrounds, an overview of the Proposed Development and alternatives that were considered during the design process, and the approach and methodology to the EIA.

- 3.1.2 The ES covers the following technical disciplines as agreed with PINS in the Scoping Opinion in **Appendix 2.2** of the ES Appendices:

Chapter 6 – Landscape and Visual

Chapter 7 – Ecology and Biodiversity

Chapter 8 – Cultural heritage

Chapter 9 – Highways and Access

Chapter 10 – Noise and Vibration

Chapter 11 – Water Resources and Ground Conditions

Chapter 12 – Land Use and Soils

Chapter 13 – Climate Change and Resilience

Chapter 14 – Socio-Economics

Chapter 15 – Other Environmental Topics (comprising Air Quality, Arboriculture, Glint and Glare, Major Accidents and/or Disasters, Utilities/EMF, Waste)

- 3.1.3 **Chapter 16: Effect Interactions** documents the effect interactions that lead to combined effects on sensitive receptors.
- 3.1.4 **Chapter 17: Summary of Significant Effects** presents a brief summary of the residual significant effects remaining following the implementation of additional mitigation.
- 3.1.5 The EIA considers impacts during the construction, operation and decommissioning of the Proposed Development. In order to identify the likely significant effects of the Proposed Development on the environment.
- 3.1.6 Environmental effects of the Proposed Development have been identified through a process by which the sensitivity of the receptor, and the level and type of change are considered to determine the significance of effect.
- 3.1.7 Mitigation measures have been developed through the project and embedded into the design and layout of the Proposed Development, referred to as embedded mitigation.
- 3.1.8 The embedded mitigation measures include the Green Infrastructure Strategy within Mitigation and Enhancement Areas and environmental

management plans. The embedded mitigation measures have been taken into account when considering the potential effects of the Proposed Development.

- 3.1.9 The residual effects presented in the ES take into account secondary mitigation (additional mitigation identified to ameliorate significant adverse effects).
- 3.1.10 Finally, a summary of the significant residual effects following the implementation of additional mitigation is presented.

4.0 Findings of the Environmental Statement

- 4.1.1 **Chapters 6-17** of the ES present the findings of the ES across all the technical topics in addition to interaction of effects and cumulative effects.
- 4.1.2 An assessment of the environmental effects of the Proposed Development during its construction, operation (including maintenance), and decommissioning has been completed for each of the topics.

4.2 Chapter 6: Landscape and Visual

- 4.2.1 This chapter considers the potential effects generated by the Proposed Development during construction, operation and decommissioning in relation to Landscape and Visual. Potential effects associated with the highway works have been scoped out as no likely significant effects are anticipated.
- 4.2.2 The potential for significant adverse effects to landscape character would be limited to extent of the Solar PV Site and local context (up to 500m from the Solar PV Site boundary) for the two local landscape character areas (Rutland Plateau D(ii) Clay Woodlands and Kesteven Uplands) where there would be Major-Moderate adverse effects which are significant. Beyond the extent of the Solar PV Site and its immediate context, the

effects on the wider landscape character are likely to reduce quickly with distance, and are likely to be minimal and not significant. Other landscape character areas within the 2km study area due to distance from the Solar PV Site are unlikely to experience any significant adverse effects greater than Minimal significance which are not significant.

- 4.2.3 Visual effects arising from the Proposed Development would be confined to within 500m south, west and north and limited to visual receptor group 1 which located within or in close proximity to the Solar PV Site. This receptor would experience Major-Moderate adverse effects which are significant however these would reduce over time as the proposed vegetation matures and provides further visual screening.
- 4.2.4 For other visual receptor groups beyond the Solar PV Site impacts range from Moderate significance reducing to Minimal (which are not significant), with all effects reducing over time as new planting matures and provides further visual screening.
- 4.2.5 Views from PRow outside of the Solar PV Site would change from views over open fields to views along GI corridors that simultaneously function to improve the landscape fabric by introducing new and enhanced hedgerows and tree belts. Adverse effects would be minimal and not significant.

4.3 Chapter 7: Ecology and Biodiversity

- 4.3.1 This chapter considers the potential effects generated by the Proposed Development during construction, operation and decommissioning in relation to Ecology and Biodiversity.
- 4.3.2 During all phases no direct adverse effects to designated sites are considered likely. Any works to SSSIs will be agreed in advance with Natural England and appropriate measures for restoration included.

Similarly, impacts to Local Wildlife Sites will be mitigated for with appropriate reinstatement of the existing habitats. Due to anticipated levels of traffic movements and construction works no effects on the SSSIs are likely to occur as a result of noise or air pollution. With the implementation of the oCEMP and oDEMP and avoidance the statutory and non-statutory designated sites within or adjacent to the Order limits, the Proposed Development would have the potential for adverse effects at the Site level, which is not significant. No adverse effects are anticipated on statutory designated sites within or adjacent to the Order limits. Adverse effects on non-statutory sites would be negligible.

- 4.3.3 The only substantial loss of habitats will be as a result of arable land, which is of site value, being replaced with PV Arrays and associated infrastructure. Where arable land is replaced with hard standing, this represents a minor loss in terms of ecological value and extent and is likely to be an adverse effect of significance at a site level only which is not significant. Permanent grassland underneath the PV Arrays and wildflower grassland in other areas will be delivered as part of the Proposed Development, which is likely to be an overall beneficial effect at a district level and not significant.
- 4.3.4 With the implementation of the oCEMP and oDEMP the risk of accidental damage to retained habitats onsite during the construction and decommissioning phases would result in adverse effects at the site level only, which is not significant.
- 4.3.5 During the operational phase, the onsite habitats will be managed in accordance with the oLEMP. No additional effects therefore will arise during the operational phase.

- 4.3.6 Offsite ancient and ancient replanted woodland will not be subject to any direct effects and appropriate stand offs have been incorporated into the design.
- 4.3.7 The Proposed Development will not remove any trees or buildings suitable for roosting bats, hedgerows or other linear features (with the exception of small breaks which would remain unlit) used by commuting or foraging bats. With the implementation of the oCEMP and oDEMP to avoid accidental damage to roost features, adverse effects would be limited to the site level and not significant on roosting bats. Due to the implementation of the oLEMP, a beneficial effect at the district level is anticipated for foraging bats, which is not significant.
- 4.3.8 Updated badger surveys will be carried out prior to the start of the construction and decommissioning phases to identify any additional setts present within or adjacent to the working areas. The number of badger setts to be closed prior to construction will be limited and priority for retention will be given to main setts. With the implementation of the oCEMP and oDEMP and use of licences where required, there would be a potential adverse effect at the site level on badger setts during construction and decommissioning which is not significant.
- 4.3.9 Suitable gaps (indicatively 30 x 30cm) will be incorporated into all lengths of security fencing to allow badgers to pass beneath. The habitat creation and enhancements will likely increase the amount of foraging habitat for badgers, including the extent of grassland beneath the PV Arrays (a more favourable habitat for foraging than arable land), resulting in a beneficial effect of significance at up to district level, which is not significant.
- 4.3.10 The retention of the West Glen River and associated habitats with the implementation of the oCEMP and oDEMP will ensure that adverse effects

on water vole and otter during construction and decommissioning would be limited to the site level, which is not significant.

- 4.3.11 With the implementation of the oCEMP and oDEMP the potential for adverse effects on Hazel dormouse and other mammals during construction and decommissioning would be limited to the site level and not significant. During operation, direct impact to this species will be avoided as management of new and retained habitats will be carried out in accordance with the oLEMP. Habitat creation within the buffer zones between retained hedgerows and/or ditches and the security fencing surrounding the PV Arrays will likely result in a beneficial effect on Hazel dormouse at site level, which is not significant.
- 4.3.12 During construction and decommissioning the potential for adverse effects on breeding birds would be limited to the site level which is not significant. The hedgerow, scrub and woodland will be retained and enhanced by providing supporting habitat such as diverse grassland and additional scrub or hedgerow. Therefore, during operation, breeding birds would experience beneficial effects at the district level which is not significant.
- 4.3.13 It is likely there will be a loss of a number of skylark territories as a result of the installation of the PV Arrays. With the provision of skylark breeding plots delivered through the oLEMP this would be limited to an adverse effect at the site level, which is not significant.
- 4.3.14 Yellow wagtail may be affected by the Proposed Development. However, they are present in very low numbers and the adverse effect would be limited to at the site level only, which is not significant.
- 4.3.15 During construction and decommissioning reptiles and amphibians would be subject to adverse effects at the site level, which is not significant.

- 4.3.16 During operation the Proposed Development will likely increase the availability and quality of habitat for reptiles (delivered through the oLEMP), resulting in a beneficial effect at the site level, which is not significant.
- 4.3.17 Adverse effects as a result of injury to individual protected species (great crested newt) during the construction and decommissioning phases are highly unlikely. Further surveys to confirm the presence or likely absence of great crested newts will be undertaken to inform the mitigation strategy. The removal of the grassland under the Solar PV Arrays at the decommissioning phase is highly unlikely to have an adverse effect on any amphibians, and is likely to represent, at worst, a return to the pre-development baseline conditions. Small scale removal of habitat to enable the removal of infrastructure may result in an adverse effect of significance a site level only.
- 4.3.18 At the operational phase, the Proposed Development will result in the retention of breeding habitat and provide an increase in suitable terrestrial habitat. Therefore, with regard to amphibians, there is likely to be a beneficial effect of significance at up to a district level.

4.4 Chapter 8: Cultural Heritage and Archaeology

- 4.4.1 This chapter considers the potential effects of the Proposed Development during construction, operation and decommissioning on cultural heritage resources, encompassing archaeological remains, built heritage and historic landscape.
- 4.4.2 The Proposed Development has the potential to affect buried archaeological remains during construction work that disturbs the ground and to the experience of built heritage assets and historic landscape features via changes to the character of their setting.

- 4.4.3 The construction groundworks have the potential to physically impact upon any surviving buried archaeological remains. The excavation of trenches for the low voltage distribution or grid connection cables, access tracks, temporary compounds and the foundations for the Solar Stations, have the potential to result in the damage to or loss of buried archaeological remains which may be present within their footprint. With archaeological investigation and avoiding particularly sensitive locations with non-ground disturbing techniques, adverse effects are considered to be minor adverse and not significant.
- 4.4.4 The installation of the Mounting Structures (set upon piles) will involve very minimal disturbance of the subsoil. Should a pile location (or even several pile locations) coincide with buried archaeological remains, the quantity of displaced archaeological remains in the case of larger features, such as the in-filled ditches, would be insignificant compared to that left undisturbed. For discrete or less robust buried features such as pits, post holes or stake holes, the probability that piles would be aligned in such a way that any more than a tiny percentage of the features would be affected is very low, and complete avoidance is the most likely outcome. It is considered at this stage that the impact on buried archaeology due to piling would be minor at worst which is not significant.
- 4.4.5 The Proposed Development would change the character of land parcels lying within the wider and peripheral setting of several Listed Buildings, Conservation Areas, RPGs and Scheduled Monuments. The Proposed Development is sufficiently distanced from any of these heritage assets such that no material views or experiences of them would be changed with the retention of existing hedgerows/woodland and implementation of

landscape screening. Effects are considered to be natural and not significant.

4.5 Chapter 9: Highways and Access

- 4.5.1 This chapter considers the potential effects generated by the Proposed Development during construction and decommissioning in relation to Access and Highways. Decommissioning has not been assessed separately as it is assumed that the decommissioning phase will be no worse than the construction phase. Potential effects during operation have been scoped out of the assessment as no likely significant effects are anticipated on the basis of the low numbers of anticipated staff vehicle movements.
- 4.5.2 The assessment methodology for predicting the volume of construction traffic trip rates has been discussed and agreed with stakeholders. These trip rates have been generated by comparing the number of PV modules and associated construction vehicles at a comparable recent Nationally Significant Infrastructure Project (NSIP). These trip rates have then been applied to the existing traffic flows along the roads within the study area to establish the percentage change in daily annual average daily traffic, and the total number of daily Heavy Goods Vehicles (HGVs).
- 4.5.3 With the exception of Uffington Lane, the construction phase of the Proposed Development will result in an increase of up to 2% of the daily annual average daily traffic, and up to 11% increase in the total number of daily Heavy Goods Vehicles (HGVs) along Ryhall Road.
- 4.5.4 Along Uffington Lane, there is anticipated to be an increase of 48% in the total annual average daily traffic during the construction phase. However, this is due to the Uffington Lane having very low levels of existing traffic

and the link serving as the proposed primary construction compound access.

- 4.5.5 The following assessment takes into account the implementation of the oTP, oCTMP and oDTMP.
- 4.5.6 It is considered that there are a minimal number of pedestrian desire lines across Uffington Lane, meaning the change in severance will not be significant. Therefore, even when considering the impact on Uffington Lane, the effect on severance is likely to be negligible and non-significant overall.
- 4.5.7 It is considered that the uplift on the roads (links) within the study area, with the exception of Uffington Lane, would fall well within the typical levels of daily traffic fluctuation on the highway network. In addition, there will be a non-significant traffic effect on the morning and evening peak hours, when the local road network is generally the most congested.
- 4.5.8 With respect to Uffington Lane, whilst the uplift in traffic flows may result in more driver delay than at present, it is not considered that this will be significant due to the low volumes of existing traffic and minimal delay that takes place at present. On that basis, it is considered that the construction phase of the Proposed Development will have a negligible and non-significant effect on driver delay.
- 4.5.9 There are a minimal number of pedestrian and cyclist desire lines across the roads (links) within the study area, and within the Local Road Network (LRN) as a whole. The construction phase of the Proposed Development will result in a change of well below the quarter threshold recommended within the industry guidance for pedestrian delay with a maximum increase of 2% on Ryhall Road (excluding Link Uffington Lane).

- 4.5.10 Whilst the increase on Uffington Lane exceeds this threshold, there are no key desire lines or provisions for pedestrians or cyclists across this link. As such, the effect of the increase will be negligible and non-significant on pedestrian and cyclist delay.
- 4.5.11 Whilst there may be some associated recreational use of this link by pedestrians and cyclists, it is likely that this would be on an ad-hoc basis and outside of the typical proposed construction site working hours, as well as being influenced by other factors such as time of year and weather. On that basis, it is considered that the construction phase of the Proposed Development will have a negligible and non-significant effect on Pedestrian and Cyclist Amenity overall.
- 4.5.12 Due to the rural nature of the Order limits, the majority of the LRN does not benefit from any footway provision, meaning pedestrians are not segregated from traffic. However, the volume of pedestrians using the LRN is also considered to be low, with the majority of pedestrian trips likely associated with recreational activity and are likely taking place outside of times where construction traffic from the Proposed Development would be operational.
- 4.5.13 As the construction phase of the Proposed Development will lead to a negligible increase across the majority of the LRN (excluding Uffington Lane), the assessment methodology suggests this will lead to a negligible and non-significant effect on Fear and Intimidation overall.
- 4.5.14 It is considered that as there are minimal desire lines across Uffington Lane and fewer receptors to impact and cause any perceived changes in Fear and Intimidation. On that basis, any potential change in Fear and Intimidation on Uffington Lane would be negligible non-significant.

- 4.5.15 Construction traffic would only access the Solar PV Site via the proposed construction traffic routes and access and will consequently avoid using inappropriate roads or other part so the network that have identified constraints. On that basis, and using professional judgement, it is considered that the construction phase of the Proposed Development would have a negligible and non-significant effect on Accidents and Safety.
- 4.5.16 Analysis of the LRN indicates that there are no particular features, such as significant vertical drops immediately beyond the carriageway, which would suggest that the transfer of materials poses a particular risk beyond that which would be expected on the general highway network. On that basis, the construction phase of the Proposed Development in relation to the use of Hazardous Loads is considered to result in a negligible and non-significant effect.

4.6 Chapter 10: Noise and Vibration

- 4.6.1 This chapter considers the potential effects of the Proposed Development during construction, operation and decommissioning in relation to noise and vibration including construction traffic travelling to and from the Order limits, onsite construction noise and noise associated with the operation of electrical and mechanical infrastructure during the operational phase.
- 4.6.2 Operational traffic would be very limited and associated impacts have been scoped out as agreed with the Planning Inspectorate (PINS). The Proposed Development would generate non-significant levels of vibration during operation and therefore this was also scoped out as agreed with PINS.
- 4.6.3 The following assessment of construction and decommissioning effects takes into account the implementation of the oCEMP and oDEMP which

includes the restriction of working hours and good practice management of construction activities.

- 4.6.4 For receptors located at less than 100m from the Solar PV Site increased construction noise levels could be experienced during earth works. Piling of the Mounting Structure support structures would potentially generate similar levels for these properties if percussive piling were used, but this would only be for a very brief period with the activity moving further away rapidly.
- 4.6.5 Whilst this represents a potential for moderate construction noise magnitude if these activities were ongoing for extended periods, the construction activities will move more than 100m from each of the properties concerned within a period of a few weeks at most, and therefore the associated levels would last less than one month. For the majority of the construction period, works would be undertaken at distances of 200m and more from the properties, corresponding to reduced levels noise levels. When accounting for the short duration of the worst-case impacts, and the reduced magnitude of change when work would be undertaken further away, these activities are considered a low magnitude of change and therefore minor significance of effect which is not significant.
- 4.6.6 Specific construction activities associated with cable laying (e.g. HDD) could be required outside of the assumed day-time construction hours (i.e. evening, Sundays, Bank Holidays or at night). For the closest receptors to the south or east of the Order limits, the provision of acoustic screening around the plant would ensure that the corresponding worst-case noise levels would represent a minor significance of effect which is not significant.

- 4.6.7 Some of the construction activities, such as piling operations, drilling or vibratory rolling techniques, can generate vibration levels in close proximity to their use. The proposed HDD drilling would be undertaken at such a distance from the nearest sensitive receptors that the associated vibration levels would be negligible. Percussive piling at distances of 40-50m from Green Lane Farm could generate worst-case Peak Particle Velocity (PPV) levels that would be potentially just noticeable but not significant. Similarly, vibratory ground compaction, if used, would generate levels corresponding to a minor adverse effect which is not significant.
- 4.6.8 In terms of noise generated by construction traffic, a very low increase in noise levels is predicted. For the primary construction compound access on Uffington Lane, the relative increase in traffic would be higher but the absolute level of traffic remains very low, and no noise-sensitive receptors are located alongside this road. This therefore corresponds to a negligible effect which is not significant.
- 4.6.9 Decommissioning is likely to involve activities of similar or reduced intensity as for the construction phase and therefore result in comparable noise and vibration effects in the most part. However, HDD or piling are unlikely to be required for this phase. The corresponding impacts would therefore be minor adverse and not significant.
- 4.6.10 During operation the main potential source of noise is the Primary Onsite Substation, which would typically include one large transformer as well as other voltage regulation electrical plant which can generate noise in operation, including a tonal character. As the proposed location for this equipment is more than 600m from the nearest noise-sensitive receptors, the associated levels of operational noise from this facility result in a low impact. This noise level would, however, be above those experienced

during very quiet periods (for example at night) but would remain low in absolute terms such that that they correspond to a minor adverse effect which is not significant.

4.6.11 Properties located within 100m of the Solar PV Site an increase could be experienced if the main sources of noise identified were placed on the closest edge of the Solar PV Site to these properties. This would potentially represent a medium to high magnitude of impact in the absence of further mitigation. In contrast, at distances of 200m or more from the main noise-generating plant items identified noise levels would correspond to a low magnitude of change.

4.6.12 With the implementation of mitigation measures such as micro siting, selection of electrical plant, attenuation and/or screening if required, adverse effects would be limited to minor adverse and not significant.

4.7 Chapter 11: Water Resources and Ground Conditions

4.7.1 This chapter considers the potential effects generated by the Proposed Development during construction, operation and decommissioning in relation to Water Resources and Ground Conditions.

4.7.2 The Proposed Development will not result in substantial impediments to near-surface water flow as the detailed Order limits drainage design will take into account any severance of saturated areas to ensure hydrological connectivity is maintained. The Proposed Development will involve the installation of PV Arrays arranged on Mounting Structures. The Mounting Structure posts will be driven into the ground up to a maximum depth of 2.5m. It is considered that installing Mounting Structure posts will have a negligible effect on the displacement or change in sub-surface water flow. This is due to the thin nature of the supporting frame.

- 4.7.3 The Flood Risk Assessment identifies that the installation of PV Arrays and establishment of grass underneath the PV Arrays does not have the potential to significantly increase surface water runoff rates compared to the baseline scenario. An Outline Surface Water Management Strategy is provided in **Appendix 11.6** of the ES which outlines the surface water management measures to be implemented at the Proposed Development.
- 4.7.4 As there would be substantially less activity during operation, and as there is unlikely to be any significant ground disturbance during operation, the magnitude of these effects is similarly reduced compared to construction.
- 4.7.5 Potential effects of decommissioning the Proposed Development are similar to those during construction. These effects would be substantially lower in magnitude than during construction.
- 4.7.6 With the implementation of the oCEMP, oDEMP and oWMP all of these effects are considered to be negligible and not significant.
- 4.8 Chapter 12: Land Use and Soils**
- 4.8.1 This section considers the potential effects of the Proposed Development on agricultural land and businesses during construction, operation and decommissioning.
- 4.8.2 Agricultural land quality is assessed by the use of the system of Agricultural land Classification (ALC) devised by the (then) Ministry of Agriculture, Fisheries and Food (MAFF). This is a methodology last revised in 1988, that classifies land into five Grades, with Grades 1, 2 and 3a being considered Best and Most Versatile (BMV), and Grades 3b, 4 and 5 being of a 'poorer' quality.
- 4.8.3 An ALC Survey carried out across the Order limits sought to determine the current grading of the land within the Proposed Development and identify

the proportion of land within particular grades. The table below sets out the amount of land within each grade, across the Order limits as a whole, and also within the Solar PV Site and field margins, showing that over half of the land within the Order limits does not comprise BMV land.

Table 1: ALC Results for the Order limits and Solar PV Site Area

ALC#	Order limits		Solar PV Site and field margins	
	Area (Ha)	Area (% of total Site)	Area (ha)	Area (% of Solar PV Site)
Grade 1	0	0%	0	0%
Grade 2	100	11.7%	35	6.6%
Grade 3a	260	30.5%	181	34.1%
Grade 3b	439	51.5%	297	55.9%
Grade 4	18	2.1%	18	3.4%
Grade 5	0	0%	0	
Non-agricultural	0	0%	0	
Urban	3	0.4%	0	
Not surveyed (roads, railways, verges etc.)	32	3.8%	0	
Total	852	100%	531	100%

4.8.4 # The ALC identifies the areas in hectares and the proportions of land in each grade. All figures are rounded to the nearest hectare.

4.8.5 The ALC grading system is based on a climate data set from 1950-1980, to enable comparative assessments and provide longevity to surveys. In the absence of a review of this methodology, the ALC grades across the Oder limits are not expected to change.

- 4.8.6 The results of the mapping of grades has influenced the design and layout of the Solar PV Site to reduce the distribution of panels across the land identified within ALC Grade 2, with all fields that comprise entirely Grade 2 being removed from the Proposed Development.
- 4.8.7 The potential for adverse effects on agricultural land (both on the soils and the land quality) is greatest during the construction phase. Good soil management practices such as avoiding trafficking or handling soils when wet, and restoring soils into trenches in the same order they came out, will be adhered to during construction. An outline Soil Management Plan (oSMP) and outline Construction Environmental Management Plan (oCEMP) have been prepared to guide soil management practices.
- 4.8.8 The installation of the PV Arrays will not result in significant adverse effects on soils and will not result in any change to the ALC grading. The areas containing the PV Arrays are not sealed over, downgraded, or irreversibly affected. There will be a land-use / management change, but the agricultural land will otherwise not be adversely affected.
- 4.8.9 None of the occupying farm business will cease. All have considerable areas of land that extend beyond the Solar PV Site and will continue as active, viable, full time farms.
- 4.8.10 There is potential for considerable benefits to the soil. Carbon is held in soil in two principal ways; soil organic carbon (SOC), being organic matter levels in the soils, and soil inorganic carbon (SIC) mostly held in weathering rocks within the soil. A long term land use change such as the conversion of arable land to grassland has a beneficial impact on SOC.
- 4.8.11 The decommissioning process would involve the dismantling and removal of the Proposed Development. Areas of access tracks and Solar Stations

would be restored using soil retained onsite from the construction phase, which will have been retained on site in managed mounds.

4.8.12 Taking into account the implementation of the oCEMP, oDEMP, oSMP and oOEMP, all of these effects are anticipated to be Slight adverse and not significant.

4.8.13 Overall, the Proposed Development will not effect the underlying land quality, and there are no significant adverse effects on land quality, soils, or farm businesses.

4.9 Chapter 13: Climate Change

4.9.1 This section considers the potential effects of the Proposed Development on in relation to Climate Change during construction, operation and decommissioning.

4.9.2 The emissions of greenhouse gasses (GHG) to the atmosphere associated with the construction, operation and decommissioning of the Proposed Development has been estimated based on the Intergovernmental Panel on Climate Change (IPCC) Annex III, which meets the methodology principles for GHG quantification set out in the IEMA guidance, '*Assessing Greenhouse Gas Emissions and Evaluating their Significance*'.

4.9.3 The assessment comprises three parts within which different receptors are applicable:

- a. The vulnerability of the Proposed Development to the effects of climate change;
- b. The effect of GHG emissions associated with the Proposed Development on the global climate.
- c. Effects of Climate Change on environmental receptors potentially affected by the Proposed Development.

- 4.9.4 The Proposed Development includes embedded mitigation which will reduce the GHG footprint through the adoption of measures set out within the oCEMP and oDEMP.
- 4.9.5 Proposed Development could potentially be sensitive to changes in climatic variables, including atmospheric circulation, land cover changes, rainfall/flooding and temperature increases, given the riparian location of the Order limits. The Proposed Development could also be sensitive to the frequency of extreme wind events (e.g., storms) which could damage solar panels.
- 4.9.6 The Proposed Development infrastructure has been located out-with areas identified to be at risk of flooding during a 1 in 100-year rainfall event, accounting for the increases in rainfall associated with climate change. This sequential design methodology ensures that the Proposed Development is not vulnerable to increases in rainfall intensities leading to extreme flood events.
- 4.9.7 When operational, the Proposed Development will generate electricity from a renewable source and export this to the National Grid. The Proposed Development is anticipated to have an installed capacity of 350 MWp, a capacity factor estimated at 10 % and would be available to operate for 8,760 hours per year. This means that the Proposed Development is anticipated to generate approximately 350,000 MWh of renewable electricity per year.
- 4.9.8 Grid decarbonisation will reduce the average emissions of CO₂ and therefore the total reduction of savings associated with the Proposed Development correspondingly. To achieve decarbonisation of the grid, energy sources such as the Proposed Development are required to meet Government targets relating to GHG emissions. Therefore, whilst the

decarbonisation of the grid would reduce the savings associated with the Proposed Development, infrastructure such as the Proposed Development is a pre-requisite to such decarbonisation.

4.9.9 The CO₂ emissions of the Proposed Development would therefore be displaced within approximately 10.5 years, and all savings beyond that would be a net benefit of the Proposed Development to reducing climate change, relative to the baseline. Over 40 years, for example, the saving is estimated at approximately 1.9 million tonnes of CO₂. This is considered to be a material beneficial change to the UK's emissions of climate-changing GHG and is therefore a moderate beneficial effect that is significant.

4.9.10 The Climate Change assessment has identified that all effects are either beneficial or, if adverse, are of such limited nature that they are not significant.

4.10 Chapter 14: Socio-economics

4.10.1 This chapter considers the potential effects generated by the Proposed Development during construction, operation and decommissioning in relation to Socio-economics.

4.10.2 Economic benefits will arise from the provision of temporary jobs over the construction phase of the Proposed Development.

4.10.3 The Applicant estimates that an average of 150 full time equivalent (FTE) gross direct temporary jobs will be employed onsite over the construction phase. It can be estimated that 56 of the 150 FTE jobs could be taken by residents of the study area. It is also estimated that the construction phase will support 74.5 FTE net additional direct, indirect and induced jobs in the wider economy. The effect across the study area is therefore assessed as minor beneficial, and not significant.

- 4.10.4 The construction phase is likely to have a minimal, localised effect on the tourism economy, with hotels, bed and breakfasts, and self catering units being booked up to accommodate the demand of the construction workers.
- 4.10.5 During the construction phase, the only adverse effects would be experienced by users of PRoW within and closest to the Order limits and given that accommodation providers could potentially benefit from additional income from staying workers, it is considered that, on balance, the construction phase will have a negligible to minor adverse effect on the study area tourism economy (medium sensitivity), which is not significant.
- 4.10.6 Economic benefits will arise from the provision of monitoring and maintenance jobs supported over the operational period. It is estimated that the Proposed Development will result in a net employment gain of 4.5 FTEs over the operational phase of the Proposed Development. The scale of impact across the study area is therefore assessed as negligible beneficial and not significant.
- 4.10.7 It is estimated that the 4.5 FTE gross jobs supported during the operation phase of the Proposed Development will generate £154,800 per annum in the study area economy. The scale of impact across the study area is therefore assessed as negligible beneficial and not significant.
- 4.10.8 At the operational phase, effects to tourism are likely to be localised and there is no evidence to suggest that effects on the recreational and visual amenity would significantly reduce tourist visits to the study area. It is considered that the presence of the Proposed Development would only have a negligible adverse effect on the local tourism economy of the study area during the operation phase, which is not significant.

4.10.9 The estimated duration of the decommissioning phase is expected to be between six to 12 months, and it is anticipated that the employment and tourism effects over this period will be similar to the construction phase. At the end of its operating life, the Proposed Development would be decommissioned, all above-ground infrastructure removed, and the operational FTEs will be lost. Beyond that, any other adverse effects on tourism and recreation would be removed as the land within the Order limits will be passed back to the landowners and incorporated back into their farming enterprise.

4.11 Chapter 15: Other Matters - Air Quality

4.11.1 This chapter considers the potential effects which would be generated by the construction phase of the Proposed Development.

4.11.2 The impacts of emissions from the road traffic associated with the construction of the Proposed Development on NO₂, PM₁₀ and PM_{2.5} have the potential to affect existing sensitive receptors (such as dwellings, schools, medical facilities and ecological designated sites) located at the roadside of the proposed construction routes for the anticipated 24 months of construction. However, given the predicted construction traffic trip generation set out in **Chapter 9: Transport and Access**, which is below the IAQM thresholds, any impact on air quality is expected to be negligible with reference to EPUK/ IAQM guidance and the EIA significance criteria set out in **Chapter 2: Overview of EIA Process**, therefore no significant effects are anticipated.

4.11.3 The Applicant is not seeking a time limited operational period, however, even if the Scheme was decommissioned after 40 years, it is expected that baseline air quality conditions will be much improved due to improving vehicle technology and emerging national policy shifts to zero emission

vehicles. Therefore, there are not anticipated to be any significant adverse effects to air quality during the decommissioning of the Proposed Development.

4.12 Chapter 15: Other Matters - Arboriculture

- 4.12.1 This chapter considers the potential effects generated by the Proposed Development during construction, operation and decommissioning in relation to Arboriculture.
- 4.12.2 The AIA was undertaken in parallel with the design process to ensure arboricultural impacts have been minimised, and tree protection measures have been maximised to secure the trees unharmed retention during the construction and operation of the Proposed Development. This is achieved by itemising in detail the impact on trees and providing specific guidance on tree protection measures during the construction phase.
- 4.12.3 There are 18 trees that will be felled to facilitate the construction of the Proposed Development. The design of the Proposed Development has minimised the loss of good quality trees and as such only one category A tree is proposed to be felled, the remainder being category C.
- 4.12.4 Through the Arboricultural Impact Assessment (AIA) submitted with the DCO Application and the implementation of the Arboricultural Method Statement (AMS) and Tree Protection Plan (TPP) adverse effects would be limited to minor adverse and not significant.
- 4.12.5 During operation the potential for adverse effects on trees due to management activities to maintain the operational performance of the Proposed Development (e.g. tree management to avoid shading on the PV Panels) will be mitigated by the measures secured by the oLEMP.

4.12.6 The measures identified in the AIA, subsequent AMS/TPP and LEMP means that there are no reasonably foreseeable significant adverse effects from an arboricultural perspective as a result of the construction, operation and decommissioning of the Proposed Development. The recommended tree surgery will help to promote the longevity and safety of the existing trees within the Order limits, and is not considered significant.

4.13 Chapter 15: Other Matters - Glint and Glare

4.13.1 This section considers the potential effects of the Proposed Development on in relation to Glint and Glare during construction, operation and decommissioning.

- a. The definition of glint and glare used within the assessment is as follows:
- b. 'Glint' refers to a momentary flash of bright light typically received by moving receptors or from moving reflectors.
- c. 'Glare' refers to a continuous source of bright light typically received by static receptors or from large reflective surfaces.

4.13.2 The assessment reviews the potential impacts of the Proposed Development on Aviation, road users, dwellings, and railways, as summarised below.

Aviation

RAF Wittering

ATC Tower

4.13.3 The modelling has shown that no solar reflections are geometrically possible towards the ATC Tower at RAF Wittering from both fixed and

tracker panel layouts. No impacts upon ATC personnel are predicted and no mitigation is required.

Approach Paths

- 4.13.4 The modelling has shown that no solar reflections are geometrically possible towards either of the 2-mile approach paths for runway 07/25 at RAF Wittering from both fixed and tracker panel layouts. No impacts upon approaching aircraft are predicted and no mitigation is required.

High Level Aviation

- 4.13.5 Detailed modelling of Shacklewell Airfield, Castle Bytham Airfield and RAF Cottesmore is not recommended as all potential solar reflections are predicted to be acceptable in accordance with the associated guidance and industry best practice. No significant impacts upon Shacklewell Airfield, Castle Bytham Airfield and RAF Cottesmore are predicted.

Road Users

Fixed Panels

- 4.13.6 The modelling has shown that solar reflections are geometrically possible towards approximately 2.3km of the B1176 and 2.3km of the A6121. Significant screening in the form of existing vegetation and proposed screening / structure planting tree belt is predicted to significantly obstruct all views of the reflecting panels. No impacts upon road users along the A6121 and B1176 are predicted, and no further mitigation is required.

Tracker Panels

- 4.13.7 The modelling has shown that solar reflections are geometrically possible towards approximately 2.7km of the B1176 and 2.0km of the A6121. Significant screening in the form of existing vegetation and proposed

screening / structure planting tree belt is predicted to significantly obstruct all views of the reflecting panels. No impacts upon road users along the A6121 and B1176 are predicted, and no further mitigation is required.

Dwellings

Fixed Panels

- 4.13.8 The modelling has shown that solar reflections are geometrically possible towards receptors 113 of the 179 assessed dwelling receptors. Solar reflections towards most of these dwellings are predicted to be significantly obstructed by existing and proposed screening, or they do not occur for a duration that could be considered significant. Solar reflections towards seven dwellings occur for a duration which requires further consideration. Mitigation is not recommended for six of these dwellings because:
- 4.13.9 The distance between the observer and the closest reflecting panel area is such that the proportion of an observer's field of vision that is taken up by the reflecting area is significantly reduced;
- 4.13.10 Views are only predicted for observers above the ground floor, which is not considered to be the main living space of a dwelling; and/or
- 4.13.11 Effects will coincide with direct sunlight, which is a far more significant source of light compared to a solar reflection.
- 4.13.12 Mitigation is recommended for one dwelling due to the duration of effects and the lack of sufficient mitigating factors to reduce the level of impact.

Tracker Panels

- 4.13.13 The modelling has shown that solar reflections are geometrically possible towards 108 of the 179 assessed dwelling receptors. Solar reflections towards most of these dwellings are predicted to be significantly obstructed

by existing and proposed screening, or they do not occur for a duration that could be considered significant.

- 4.13.14 Solar reflections towards five dwellings occur for a duration which requires further consideration. Mitigation is not recommended for four of these dwellings because:
- 4.13.15 The distance between the observer and the closest reflecting panel area is such that the proportion of an observer's field of vision that is taken up by the reflecting area is significantly reduced;
- 4.13.16 Views are only predicted for observers above the ground floor, which is not considered to be the main living space of a dwelling; and/or
- 4.13.17 Effects will coincide with direct sunlight, which is a far more significant source of light compared to a solar reflection.
- 4.13.18 Mitigation is recommended for one dwelling due to the duration of effects and the lack of sufficient mitigating factors to reduce the level of impact.

Railways

Train Drivers

Fixed Panels

- 4.13.19 The modelling has shown that solar reflections are geometrically possible towards train driver receptors along approximately 3.3km of railway line. Solar reflections towards most of these sections of railway line are predicted to be significantly obstructed by existing and proposed screening or occur from outside of a train driver's primary field of view (30 degrees either side of the direction of travel).
- 4.13.20 Solar reflections towards approximately 100m of railway line occur from within a train driver's primary field of view which requires further

consideration. However, mitigation is not recommended for this section of railway line because:

- 4.13.21 No views of railway signals, stations, level crossings, or switching points is required, suggesting that the workload of a train driver will be low;
- 4.13.22 The distance between the observer and the closest reflecting panel area is such that the proportion of an observer's field of vision that is taken up by the reflecting area is significantly reduced;
- 4.13.23 Effects will coincide with direct sunlight, which is a far more significant source of light compared to a solar reflection.

Tracker Panels

- 4.13.24 The modelling has shown that solar reflections are geometrically possible towards train drivers along approximately 1.2km of railway line. Solar reflections towards all these sections of railway line are predicted to be significantly obstructed by existing and proposed screening or occur from outside of a train driver's primary field of view. No significant upon train drivers along the assessed section of railway line are predicted, and no further mitigation is required.

Signals

- 4.13.25 No railway signals have been identified on the assessed section of railway line. No impacts upon railway signals are predicted.

4.14 Chapter 15: Other Matters - Major Accidents and Disasters

- 4.14.1 This chapter considers the potential effects generated by the Proposed Development during construction, operation and decommissioning in relation to the Risk of Major Accidents and Disasters.

- 4.14.2 The Proposed Development does not introduce any construction or operational uses or procedures that are considered to have a risk of major accident or disasters that could affect existing or future sensitive receptors or which are not considered through existing regulatory regimes.
- 4.14.3 The Proposed Development will increase the amount of traffic on the public highway during the construction, operational and decommissioning phases. However, **Chapter 9: Highways and Access** of the ES shows that the construction phase of the Proposed Development would have a non-significant effect with regards to accidents and safety on the highway network.
- 4.14.4 The **Flood Risk Assessment (Appendix 11.5** of the ES) concludes that the risk of the Proposed Development flooding (including an allowance for climate change) from all potential sources of flooding is negligible and not significant and that the increased flood risk as a result of the Proposed Development would be negligible and not significant.
- 4.14.5 Health and Safety on site would be managed by the contractor during construction and decommissioning to mitigate the risk of fire in line with legislative safety requirements such as the Regulatory Reform (Fire Safety) Order 2005 and the CDM Regulations 2015. The Proposed Development is not expected to have a significant effect on the environment due to the risk of a major accident occurring as a result of fire during construction and decommissioning.
- 4.14.6 The operational phase of the Proposed Development would involve routine maintenance and servicing of equipment to ensure the safe operation of equipment. The oOEMP secures the preparation of an Emergency Response Plan as part of the OEMP. No significant effects are anticipated

following implementation of the Emergency Response Plan. No significant effects are anticipated following implementation of mitigation measures.

- 4.14.7 The Grid Connection Cable and Primary Onsite Substation, which form a part of the Proposed Development, exceed 132kV and therefore have the potential to cause electromagnetic fields with potential for adverse effects on human health. However, taking design principles into account, electromagnetic fields are unlikely to have any adverse effects on residential receptors.
- 4.14.8 Three active Upper Tier Control of Major Accident Hazards (COMAH) sites are recorded within the Essendine Industrial Estate, all registered to The Heys Group Ltd. A Notification of Installations Handling Hazardous Substances (NIHHS) is also registered to Stamford Storage Limited within the industrial estate but is 'Not Active'. Planning Hazardous Substances Consents have also been granted to Stamford Storage and Baxters Warehousing Peterborough Ltd within Essendine Industrial Estate.
- 4.14.9 The main types of major accident scenarios associated with these COMAH sites are:
- a. Liquid release - liquid flowing on-site and off-site to sewer, freshwater, estuarine waters, coastal waters, land or groundwater. Damage to people and the environment. Environmental pollution and contamination of drinking water supplies.
 - b. Release of contaminated fire water containing dangerous substances - to sewer, freshwater, estuarine waters, coastal waters, land or groundwater.
 - c. Toxic gas or smoke - a gas cloud or smoke plume (includes ecotoxic smoke) containing dangerous substances.

4.14.10 The COMAH site has prepared an internal emergency plan to deal with major accidents and has liaised with the emergency services in order to deal with major accidents and to minimise their effects.

4.14.11 NGG has two high pressure (major accident hazard pipelines) located either within the Order limits or in close proximity to the Order limits boundary. NGG's 'Guidance for developing solar farms near to gas distribution and transmission pipelines' will be followed and Protective Provisions for NGG's benefit are included within the DCO.

4.15 Chapter 15: Other Matters – Utilities

4.15.1 This section evaluates the effects of the Proposed Development on telecommunication infrastructure, television reception and existing utilities.

4.15.2 The risk of damage to utilities during construction would be minimised through the detailed design which would avoid where practicable utilities and infrastructure via micro siting of elements of the Proposed Development. The approach can be outlined as follows.

- a. locating the Proposed Development outside of utilities' protected zones;
- b. the use of ground penetrating radar before excavation to identify any unknown utilities; and
- c. consultation and agreement of construction/ demobilisation methods prior to works commencing.

4.15.3 Taking these measures into account, which are secured within the oCEMP, no adverse effects are anticipated.

4.16 Chapter 15: Other Matters – Waste

- 4.16.1 This section discusses the expected waste streams during each phase of the Proposed Development and assesses the likely significant effects that may arise from waste as a result of the Proposed Development.
- 4.16.2 Given the nature of the Proposed Development, significant quantities of waste are not anticipated.
- 4.16.3 The commercial nature of the waste to be produced during construction, operation and decommissioning will mean it will be managed by appropriately permitted carriers and facilities in line with the appropriate environmental permits and requirements. The waste carriers and landfill sites used will be determined by the contractor prior to construction and decommissioning.
- 4.16.4 A Construction Resource Management Plan (CRMP) and Decommissioning Resource Management Plan (DRMP) (as secured by the oCEMP and oDEMP) will be prepared for the construction and decommissioning phases on the basis of the outline environmental management plans that form part of the DCO. These include measures to control and manage waste onsite.
- 4.16.5 All waste transported off-site will be delivered to the appropriately licenced receivers of such materials. Operators receiving any waste materials resulting from the Proposed Development will be subject to their own consenting procedures.
- 4.16.6 Prior to construction, opportunities to minimise waste produced through the construction phase as far as possible will be explored. Possibilities to re-use or recycle materials will be explored before resorting to landfill options.

- 4.16.7 The Applicant is not seeking a time limited consent. The operational life of the Proposed Development has not been specified within the DCO Application. However, it is recognised that the electrical infrastructure will have an operational lifespan, as such, for the purposes of assessing decommissioning with the ES, it has been assumed that the Proposed Development has a 40-year operational life span to enable an assessment of decommissioning to be carried out. The operation assessment does not assume that the operational phase will be limited to 40 years as the solar infrastructure may continue to be operating successfully and safely beyond this period.
- 4.16.8 Any solar equipment that requires to be replaced during the operational period will be disposed of following the waste hierarchy, with materials being reused or recycled wherever possible. Any electrical waste will be disposed in accordance with the Waste from Electrical and Electronic Equipment (WEEE) regulations, minimising the environmental impact of the replacement of any elements of the Proposed Development.
- 4.16.9 All the solar infrastructure including PV modules, mounting structures, cabling on or near the surface, inverters, transformers, switchgear, fencing and ancillary infrastructure and the Onsite Substation would be removed and recycled or disposed of in accordance with good practice following the waste hierarchy, with materials being reused or recycled wherever possible. All waste will be disposed of in accordance with the legislation at the time of decommissioning.

4.17 Chapter 16: Interaction of Effects and Cumulative Effects

- 4.17.1 This chapter discusses the potential for the interaction of effects and cumulative effects as a result of the Proposed Development. Interaction of

effects result from the different types of effects generated by the Proposed Development having a combined effect on the same receptors.

Interaction of Effects

4.17.2 Interactions of effects occurs where several different effects resulting from the Proposed Development have the potential to affect a single receptor. This is assessed by determining residual effects, as assessed in the individual topic chapters, upon identified receptor groups. Consideration is given to the potential for multiple effect interaction to arise for each of the identified receptor groups across the construction, operation and decommissioning of the Proposed Development.

4.17.3 The receptor groups identified within this ES can be broadly categorised as follows:

- a. Landscape and visual resources: landscape character; visual receptors (residents; users of public rights of way; other visual receptors);
- b. Ecology and biodiversity: ecological nationally designated sites;
- c. Historic environment: settings of nationally designated heritage assets;
- d. Access and highways: road users, residents; pedestrians/cyclists; sensitive local uses (e.g. schools, hospitals, local facilities);
- e. Noise and vibration: residents, users of public rights of way; users of other land uses (e.g. places of work);
- f. Air quality: residents; ecological designated sites;
- g. Water resources and Ground conditions: land at risk of flooding land quality/soils;
- h. Agriculture: agricultural land; farm businesses; and
- i. Socio-economics: employment levels and tourism.

4.17.4 No significant adverse effect interaction have been identified within the ES.

Cumulative Effects

4.17.5 **Chapter 2: Overview of EIA Process**, of this ES, presents the cumulative assessment methodology including the short list of cumulative developments that were carried forward for assessment. The long list of cumulative developments initially identified is provided in **Appendix 2.4** of the ES Appendices.

4.17.6 No significant adverse cumulative effects have been identified.

4.17.7 When considered in combination with other renewable generation projects over the construction, operation and maintenance, and decommissioning of the Proposed Development, there would be a major beneficial cumulative effect on climate change through the contribution to the UK's legally binding emission reduction targets.

4.17.8 During construction there would be moderate beneficial effects on employment as a result of the combined effect of the Proposed Development with other developments which have an overlapping construction phase.

5.0 Summary of Significant Effects and Mitigation

5.1.1 **Chapter 17: Summary of Significant Effects and Mitigation** of the ES presents a summary of the likely significant residual effects taking into account additional mitigation.

5.1.2 Prior to the implementation of additional mitigation, significant effects are predicted in relation to:

a. Landscape and Visual

- b. Noise and Vibration
- c. Agricultural Land Use
- d. Glint and Glare, and
- e. Climate Change (beneficial).

5.1.3 Following the implementation of additional mitigation, significant adverse effects are only anticipated in relation to Landscape and Visual.

5.1.4 The Proposed Development would have a moderate beneficial effect, which is significant, on climate change do to the CO₂ emissions displaced by the renewable energy generated.

6.0 Summary and Conclusions

6.1.1 The ES explains the findings of the EIA process that has been undertaken for the Proposed Development.

6.1.2 A number of environmental impact avoidance, design and mitigation measures have been identified to mitigate and control environmental effects during construction, operation (including maintenance) and decommissioning of the Proposed Development. It is proposed that these will be secured through appropriate requirements and other controls within the DCO.

6.1.3 Feedback from the formal consultation process has been taken into account when preparing the Application and in undertaking the EIA process.

6.2 References

Ref 1 Planning Inspectorate, Planning Advice Note 7

Ref 2 Regulation 12(2) of the EIA Regulations

Ref 3 Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (“the EIA Regulations”)

Figures

Figure 1 Order limits

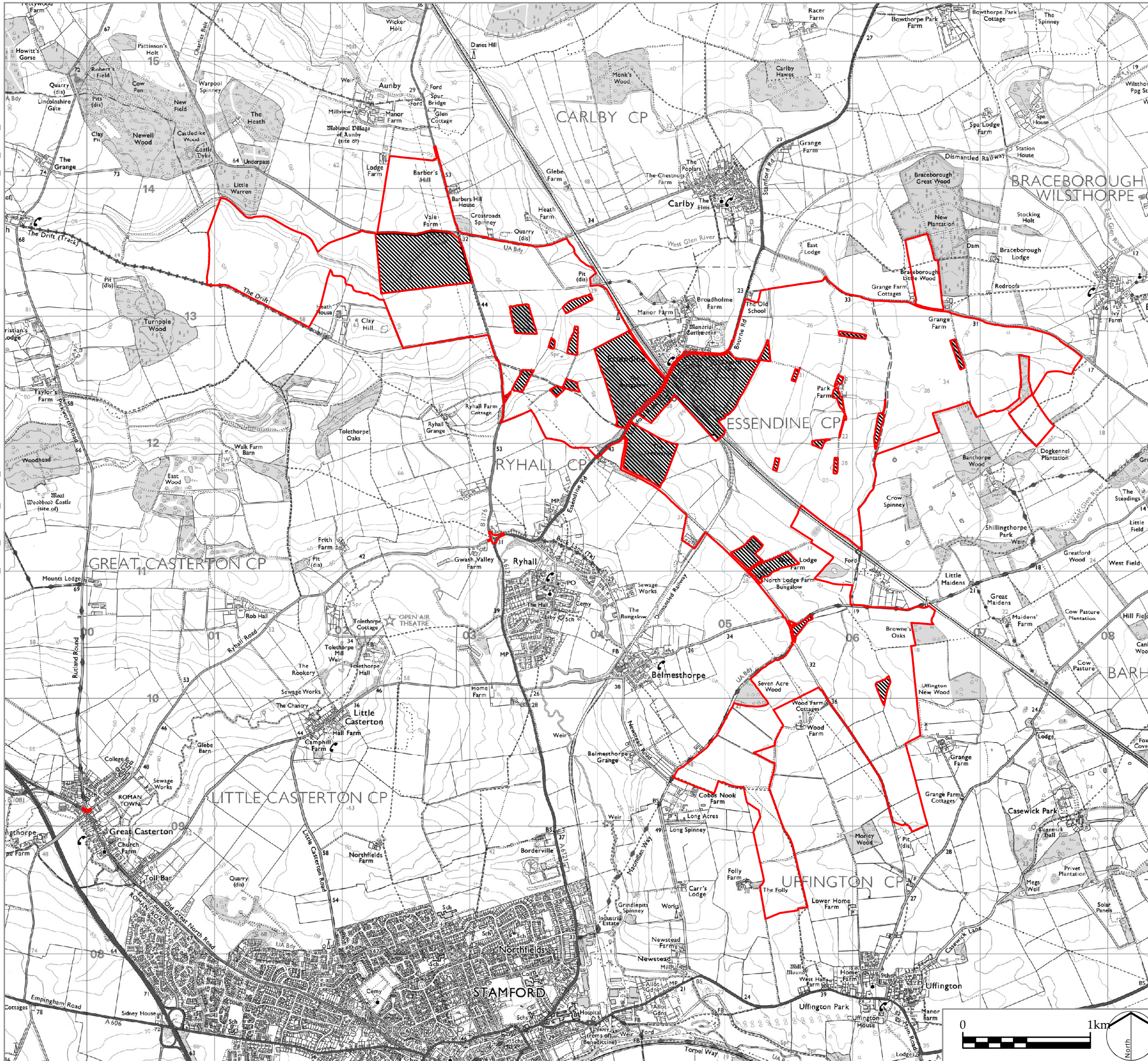
Figure 2 Extents of the Solar PV Site, Mitigation and Enhancement Areas, Highway Works Site and the Grid Connection Corridor

Figure 3 Indicative locations of the crossing points over the adopted highway

Figure 4 Cable Routes

Figure 5 Indicative locations of the primary and secondary construction compounds

Figure 6 Indicative locations of the primary and secondary access points



Infrastructure Planning (Applications:
Prescribed Forms and Procedure) Regulations 2009
APFP Regulation: 5(2)(a)

PINS REFERENCE NUMBER
EN010127

LEGEND

- Order limits
- Areas outside the Order limits

P0 DCO Submission
REV. DESCRIPTION

RP 06/11/22
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PROJECT TITLE
**MALLARD PASS SOLAR FARM
NON-TECHNICAL SUMMARY**

DRAWING TITLE
Figure 1: Order limits

ISSUED BY	Oxford	T: 01865 887050
DATE	Nov 2022	DRAWN AG
SCALE @A3	1:30,000	CHECKED PD
STATUS	Final	APPROVED RP

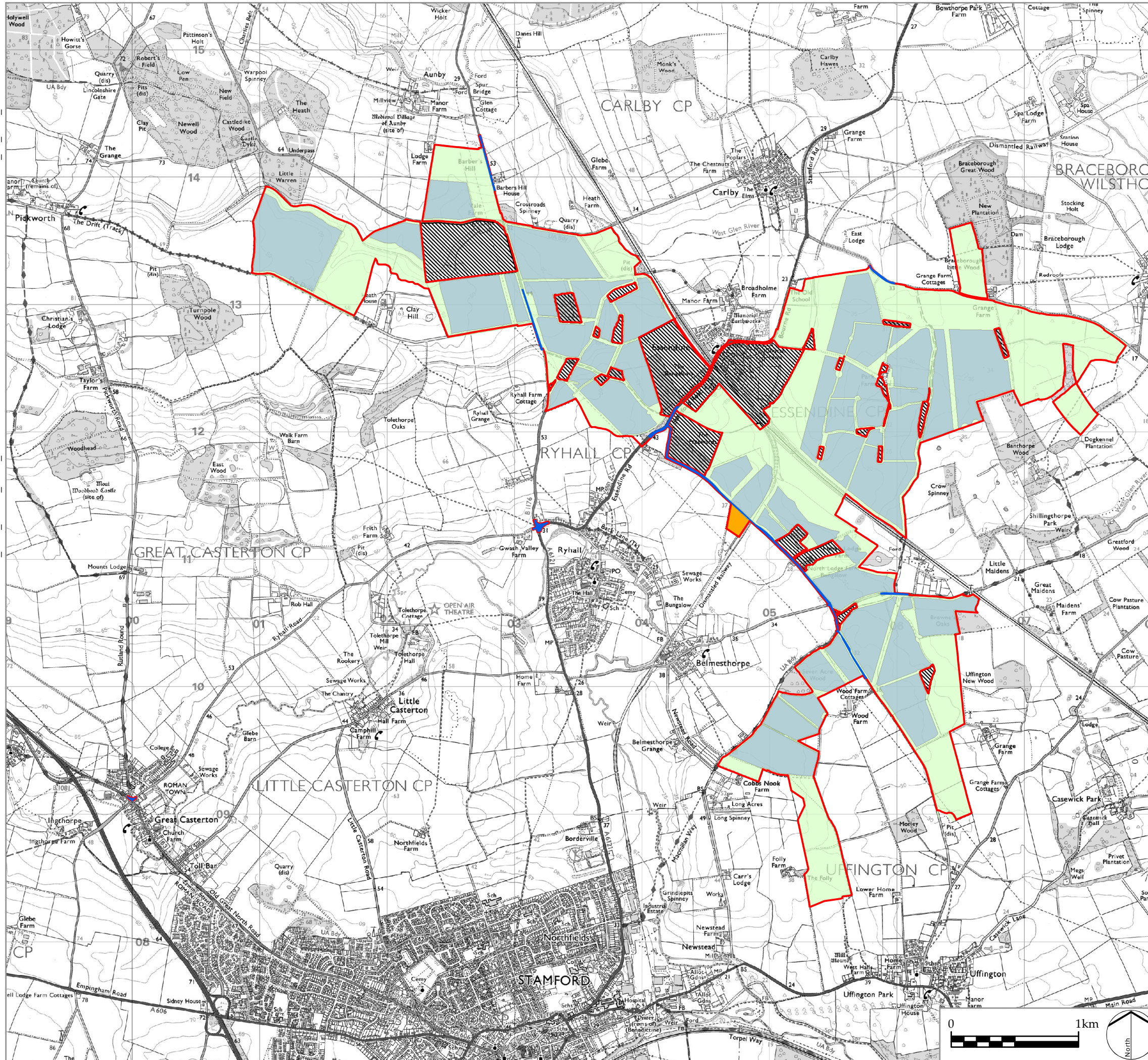
DWG. NO. 7863_SK_601a REV: P0

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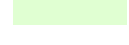



Sources: Ordnance Survey

Z:\7863_NSIP_SOLAR_FARM_CONFIDENTIAL\GIS\PROJECTS\FIGURES\7863_SK_603a_EXTENTS OF SITE.MXD



Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 APFP Regulation: 5(2)(a)

PINS REFERENCE NUMBER EN010127

- LEGEND
-  Order limits
 -  Solar PV Site
 -  Mitigation and Enhancement Areas
 -  Highway Works
 -  National Grid Ryhall Substation
 -  Areas outside the Order limits

P0 DCO Submission
REV. DESCRIPTION

RP 06/11/22
APP. DATE



PROJECT TITLE
MALLARD PASS SOLAR FARM
NON-TECHNICAL SUMMARY

DRAWING TITLE
Figure 2: Extents of the Order limits, Solar PV Site, Mitigation and Enhancement Areas and Highway Works

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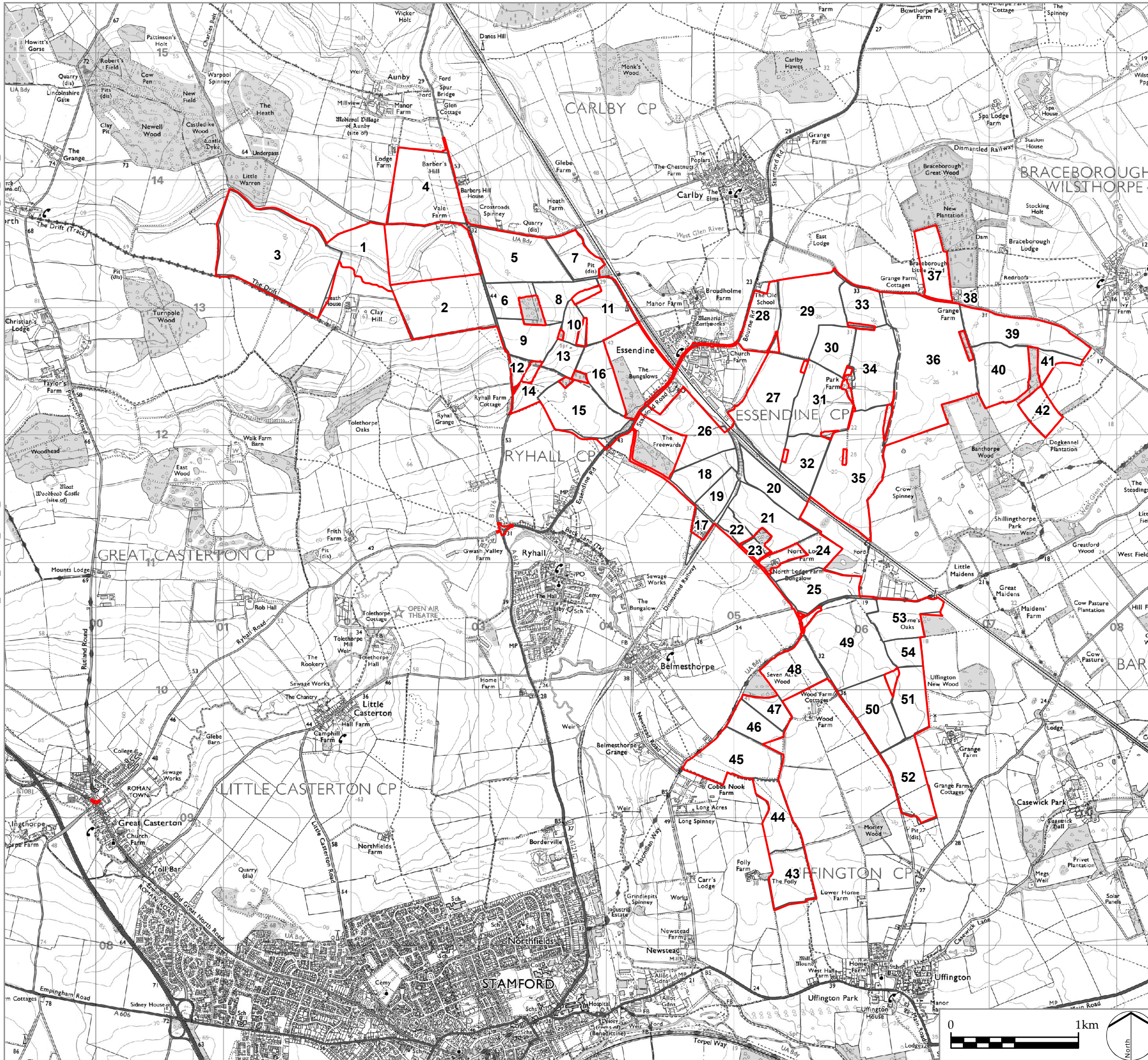
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Sources: Ordnance Survey

Z:\7863_NSIP_SOLAR_FARM_CONFIDENTIAL\GIS\PROJECTS\FIGURES\7863_SK_604a_FIELD_NUMBERING_SYSTEM.MXD



Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 APFP Regulation: 5(2)(a)

PINS REFERENCE NUMBER
EN010127

LEGEND

 Order limits

 Field Number

Note: Fields 23 and 38 are no longer included within the Order limits; however, have been included for consistency purposes.

P0 DCO Submission
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PROJECT TITLE
MALLARD PASS SOLAR FARM
NON-TECHNICAL SUMMARY

DRAWING TITLE
Figure 3: Field Numbering System

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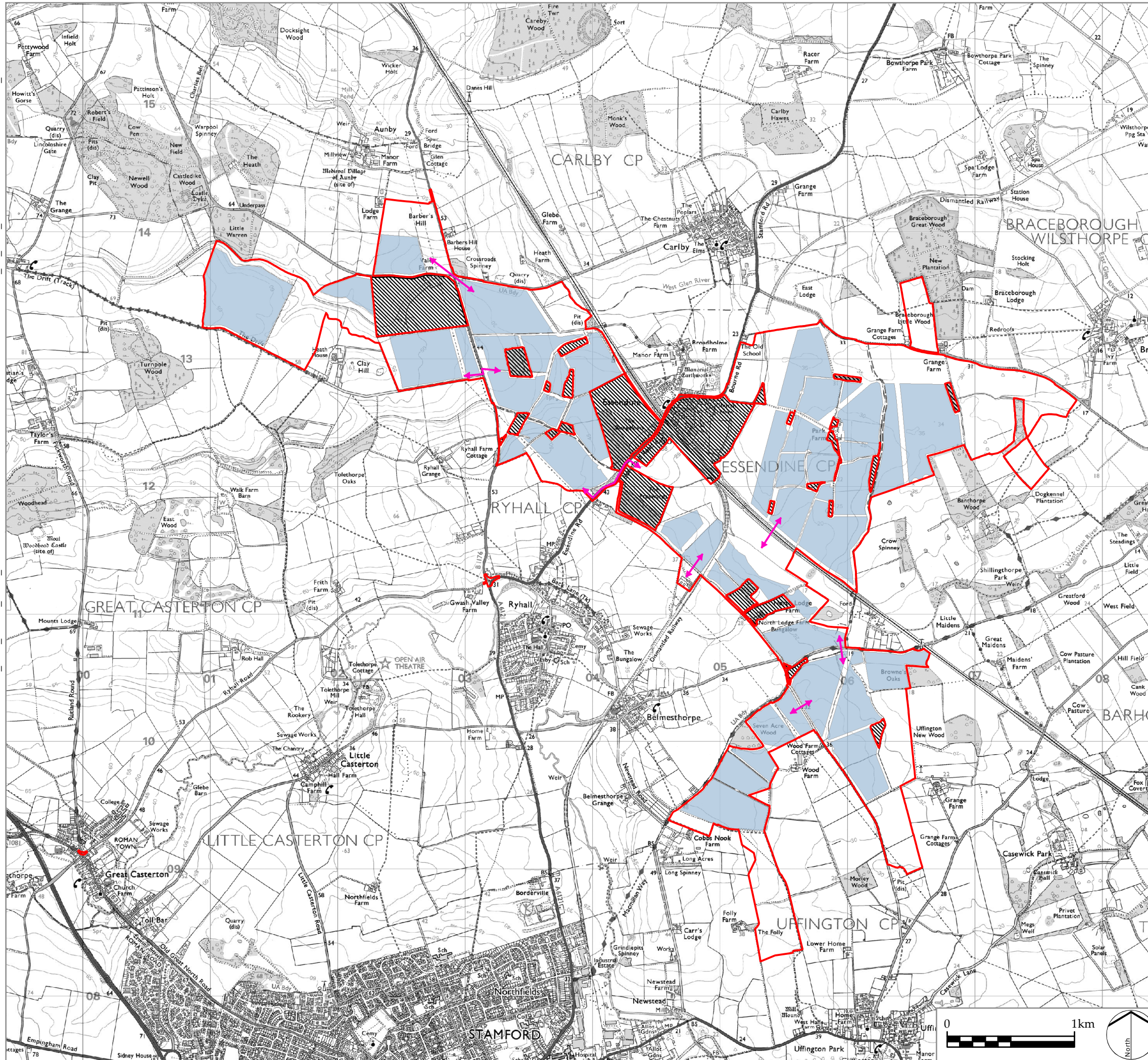
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Sources: Ordnance Survey

Z:\7863_NSIP_SOLAR_FARM_CONFIDENTIAL\GIS\PROJECTS\FIGURES\7863_SK_614A_CABLE_CROSSING_LOCATIONS_FIGURE 5.7.MXD



Infrastructure Planning (Applications:
Prescribed Forms and Procedure) Regulations 2009
APFP Regulation: 5(2)(a)

PINS REFERENCE NUMBER
EN010127

- LEGEND
- Order limits
 - Solar PV Site
 - Areas outside the Order limits
 - ↔ Indicative Cable Crossing Locations

P0 DCO Submission
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PROJECT TITLE
**MALLARD PASS SOLAR FARM
NON-TECHNICAL SUMMARY**

DRAWING TITLE
Figure 4: Indicative Cable Crossing Locations

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SCALE @A3	1:30,000	CHECKED PD
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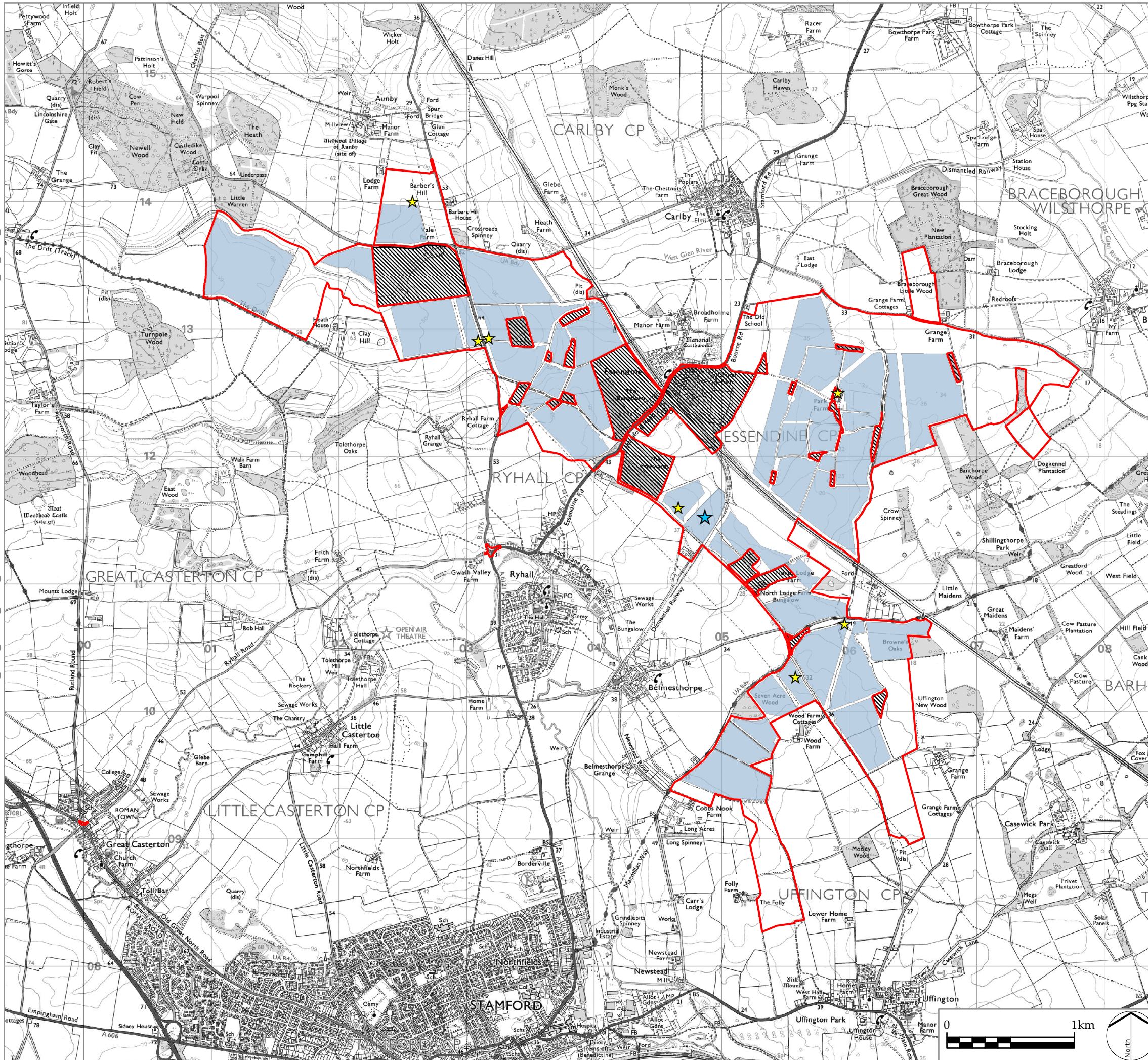
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Sources: Ordnance Survey




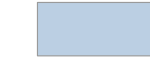



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Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 APFP Regulation: 5(2)(a)

PINS REFERENCE NUMBER
EN010127

LEGEND

-  Order limits
-  Solar PV Site
-  Areas outside the Order limits
-  Primary Construction Compound
-  Secondary Construction Compounds

P0 DCO Submission
REV. DESCRIPTION

RP 06/11/22
APP. DATE



PROJECT TITLE
**MALLARD PASS SOLAR FARM
 NON-TECHNICAL SUMMARY**

DRAWING TITLE
**Figure 5: Locations of Primary and
 Secondary Temporary Construction Compounds**

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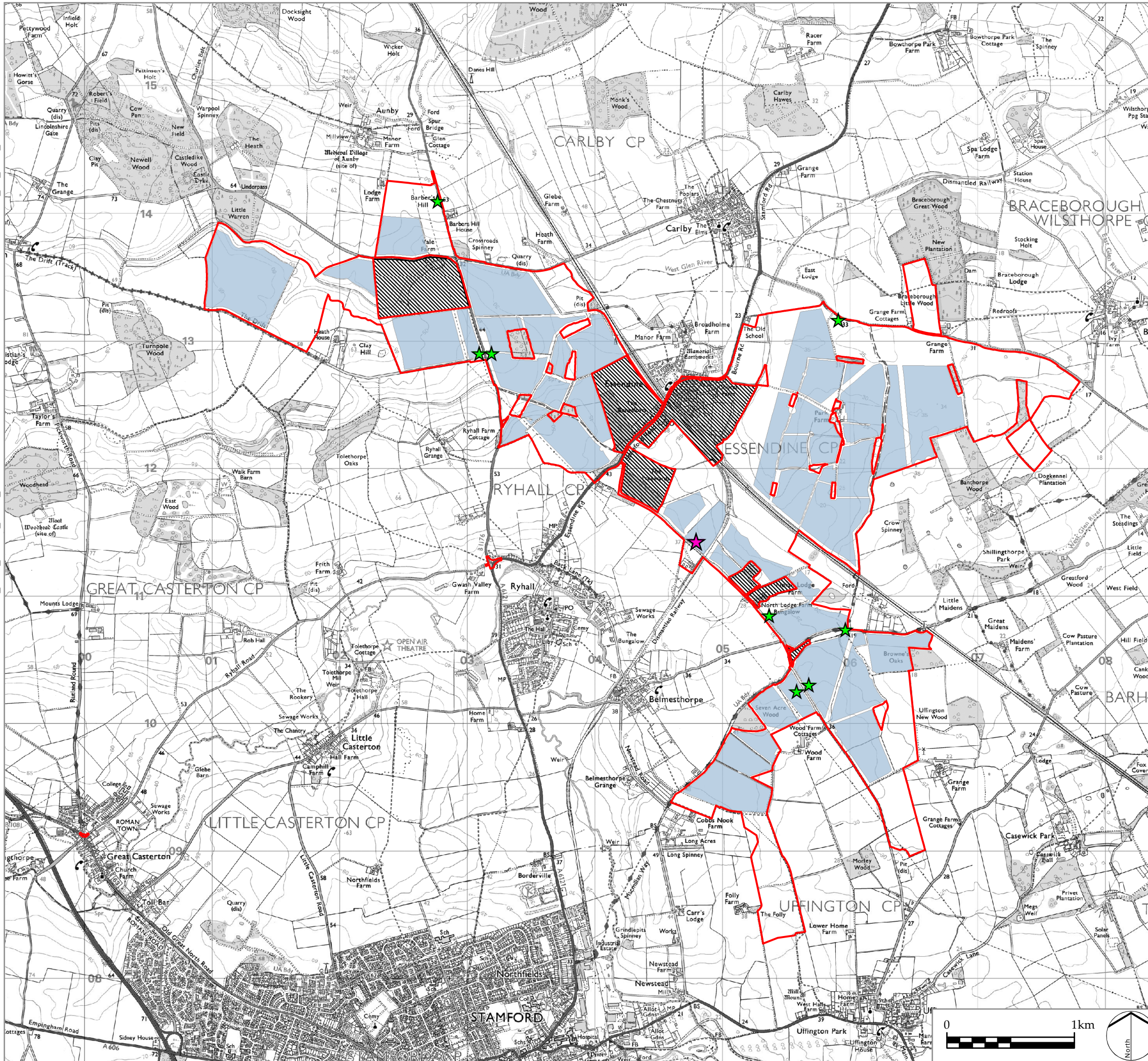
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Sources: Ordnance Survey






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Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 APFP Regulation: 5(2)(a)

PINS REFERENCE NUMBER EN010127

LEGEND

-  Order limits
-  Solar PV Site
-  Areas outside the Order limits
-  Primary Site Access Location
-  Secondary Site Access Location

P0 DCO Submission
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PROJECT TITLE
**MALLARD PASS SOLAR FARM
 NON-TECHNICAL SUMMARY**
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Figure 6: Solar PV Site Access Locations

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