

**Tillbridge Solar Project  
EN010142**

**Volume 6  
Environmental Statement  
Non-technical Summary  
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# 1. Introduction

## 1.1 Overview

- 1.1.1 This document has been prepared on behalf of Tillbridge Solar Ltd<sup>1</sup> (hereafter referred to as ‘the Applicant’) and is a Non-Technical Summary of the Environmental Statement that has been prepared for the proposed Tillbridge Solar Project (hereafter referred to as ‘the Scheme’). The Scheme is located approximately 5 kilometres (km) to the east of Gainsborough and 13km to the north of Lincoln.
- 1.1.2 The Scheme will involve the construction, operation (including maintenance) and eventual decommissioning of ground mounted solar photovoltaic (PV)<sup>2</sup> panels, along with associated infrastructure such as Battery Energy Storage Systems (BESS), across approximately 1,350 hectares (ha) of land, as well as an approximately 18.5km long underground cable to export solar electricity to the national electricity transmission network.
- 1.1.3 The Scheme is a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 (Ref. 1), as it will have the capacity to generate, store and export more than 50 megawatts (MW) of electricity. Under the Planning Act, a type of planning consent called a Development Consent Order (DCO) is required.
- 1.1.4 Following an examination by the Planning Inspectorate, this Application will be decided by the Secretary of State for Energy Security and Net Zero.

## 1.2 What is an Environmental Impact Assessment?

- 1.2.1 Environmental Impact Assessment (EIA) is a process to ensure that planning decisions are made with full knowledge of the likely significant environmental effects of a proposed development. The outcome of the EIA process is reported within an Environmental Statement submitted with a DCO application. The EIA for the Scheme is undertaken pursuant to the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (Ref. 2).
- 1.2.2 The objective of the EIA is to identify any likely significant effects which may arise from a proposed development and to identify measures to prevent, reduce or offset any adverse effects and to enhance any beneficial effects. During the EIA process for the Scheme to date, opportunities and management measures have been identified and incorporated within the development proposals to prevent or reduce any adverse environmental effects, and to enable sustainable design and construction principles to be embedded within the Scheme.

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<sup>1</sup> The Applicant is a joint venture between Tribus Clean Energy Limited and Recurrent Energy, a subsidiary of Canadian Solar, who are both experienced developers of renewable energy projects.

<sup>2</sup> Photovoltaic means the conversion of light to energy.

## 2. Scheme Location

### 2.1 The Order Limits

- 2.1.1 The Order limits represent the maximum extent of land to be used for the construction, operation (including maintenance), and decommissioning of the Scheme, and cover a total area of approximately 1,670ha. The area within and surrounding the Order limits is mostly rural, including open agricultural fields with sparse areas of woodland and villages.
- 2.1.2 The Order limits are shown on **Figure 1** of this Non-Technical Summary and comprise the following elements:
- a. 'the Principal Site', which is an approximately 1,350ha area of land where the ground mounted solar PV panels along with associated infrastructure for the storage of generated electricity, such as electrical substations, sub-surface cable connections and BESS, will be installed; and
  - b. 'the Cable Route Corridor', which comprises the area within which an approximately 18.5km length underground cable (and associated underground electrical infrastructure) will be installed, that is required to connect the Principal Site to a National Grid Substation at Cottam Power Station (hereafter referred to as the National Grid Cottam Substation). This therefore allows electricity generated by the Scheme to be exported to the National Grid.
- 2.1.3 **Chapter 2: Scheme Location** of the Environmental Statement [EN010142/APP/6.1] provides a description of the existing Site and the surrounding area within the Order limits, a summary of which is provided below.

### The Principal Site

#### Overview of the Principal Site

- 2.1.4 As shown on **Figure 1** of this Non-Technical Summary, the Principal Site is located to the south of Harpswell Lane (A631), to the west of Middle Street (B1398) and largely to the north of Kexby Road and to the east of Springthorpe. The Principal Site covers an area of approximately 1,350ha and is located entirely within the administrative area of West Lindsey District Council and Lincolnshire County Council.
- 2.1.5 Harpswell Lane (A631) and Middle Street (B1398) are located adjacent to the northern and eastern boundaries of the Principal Site. A thin strip of land on the western side of Middle Street is included within the Order limits to allow for landscape screening to be planted. The Principal Site extends to the south of Kexby Road with the inclusion of field parcels that are located to the south of the road.
- 2.1.6 The Principal Site comprises numerous field parcels used for arable farming. The fields are large with limited hedgerows and trees. Where there are hedgerows, these generally form the boundaries of fields or are adjacent to roads. There are also some small, scattered areas of woodland located



within the Principal Site, as well as some rural dwellings and agricultural buildings across the Principal Site.

- 2.1.7 Hedgerows and trees line the majority of the northern boundary of the Principal Site along Harpswell Lane (A631). To the west of the Principal Site, the surrounding area is predominantly open fields mainly bordered by hedgerows. To the east of the Principal Site, the landscape is defined by a relatively steep slope referred to as the Lincoln Cliff. The Cliff is relatively elevated compared to the remainder of the surrounding area, which is otherwise a largely flat, low-lying rural landscape.

### **Existing Environmental Features within and surrounding the Principal Site**

- 2.1.8 The Principal Site is not located within a National Landscape (formerly known as Areas of Outstanding National Beauty). An Area of Great Landscape Value (subject to Central Lincolnshire Local Plan Policy LP17 (Ref. 3)) runs along the eastern edge of the Principal Site, with a small area of the Principal Site earmarked for mitigation within this designation to the south of Harpswell.
- 2.1.9 Most of the Principal Site is located within Flood Zone 1<sup>3</sup> and is therefore at a low risk of flooding from fluvial sources and surface water. There are some watercourses located within the northern, southern and western extent of the Principal Site area, including tributaries of the River Till, with some areas at a high risk of flooding (Flood Zone 3<sup>4</sup>). There are also land drains, ponds and covered reservoirs located across the Principal Site areas.
- 2.1.10 There are no international, national, regional, or locally designated nature conservation sites within the Principal Site. Within a 10km radius of the Principal Site, there are a number of statutorily designated nature sites, including Sites of Special Scientific Interest (SSSIs). The closest to the Principal Site are Lea Marsh SSSI, located to the south of Gainsborough at approximately 6km west, and Cliff House SSSI, located 6km north-east of the Principal Site.
- 2.1.11 The majority of the Principal Site is comprised of Grade 3b land per the Agricultural Land Classification criteria (Ref. 4), although there are some isolated areas of Grade 2 and 3a land.
- 2.1.12 There are no Scheduled Monuments or other designated heritage assets located within the Principal Site. There are two Scheduled Monuments in close proximity to the Principal Site:
- a. Harpswell Hall 320m to the north-east of the Principal Site (a post medieval house and gardens that overlays earlier medieval remains); and
  - b. Elm Tree Farm (a moated manorial complex) 550m to the west of the Principal Site.
- 2.1.13 Many of the surrounding villages within 10km of the Order limits, such as Gate Burton, Marton, Torksey, Corringham, Upton, Stow, Hemswell,

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<sup>3</sup> Flood Zone 1 is defined by the Environment Agency as land having a less than 1 in 1,000 annual probability of river flooding.

<sup>4</sup> Flood Zone 3 is defined by the Environment Agency as land having a 1 in 100 or greater chance of flooding each year from rivers, when the presence of any flood defences are ignored.

Glentworth, Fillingham, Ingham, Springthorpe and Brattleby feature listed buildings and conservation areas. There is a Registered Park and Garden, associated with Fillingham Castle, located 2.2km to the east of the Principal Site.

- 2.1.14 There are limited Public Rights of Way (PRoW) within the Principal Site, the only route being a bridleway extending south from Kexby Road near Glentworth Grange, towards Willingham Road (Gltw/85/1). In addition, there is a claimed bridleway (Claimed Glentworth and Harpswell Public Bridleway 1209) that runs through the eastern extent of the Principal Site, which has been assumed will become a definitive route in due course. There are a large number of additional recreational routes and PRoW within 500m of the Principal Site, most notably the network of bridleways and footpaths between the villages of Ingham and Fillingham to the south of the Principal Site; and a network of PRoW to the west of the Principal Site around the villages of Kexby, Upton, Heapham and Springthorpe.
- 2.1.15 An overview of the environmental constraints associated with the Principal Site are shown on **Figure 2** of this Non-Technical Summary.

## The Cable Route Corridor

### Overview of the Cable Route Corridor

- 2.1.16 The Cable Route Corridor will connect the Principal Site to the existing National Grid Cottam Substation located at the decommissioned coal-fired Cottam Power Station in Nottinghamshire. The Cable Route Corridor crosses the administrative areas of West Lindsey District Council in Lincolnshire and Bassetlaw District Council in Nottinghamshire.
- 2.1.17 The Cable Route Corridor shown in **Figure 1** of this Non-Technical Summary is approximately 18.5km long with a total area of approximately 318ha.
- 2.1.18 Heading south from the Principal Site, the cable route runs parallel to Glentworth Road and crosses Common Lane, Cow Lane, Kexby Road and Fillingham Lane before turning to the west crossing South Lane, Stone Pit Lane and Normanby Road (B1241) (located to the south of Willingham by Stow). The Cable Route Corridor continues in a westerly direction before crossing the East Midlands Railway line that provides services between Doncaster and Lincoln, and runs in a north-south direction to the west of Willingham by Stow and to the east of Gate Burton. The Cable Route Corridor then continues westwards crossing the Stow Park Road (A1500), followed by the High Street (A156) before crossing the River Trent to connect to the National Grid Cottam Substation.

### Existing Environmental Features within and surrounding the Cable Route Corridor

- 2.1.19 The River Trent and River Till and their tributaries are located within the Cable Route Corridor. Parts of the Cable Route Corridor are located within Flood Zone 2<sup>5</sup> and 3, where there is increased risk from flooding.

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<sup>5</sup> Flood Zone 2 is defined by the Environment Agency as land at risk of flooding, when the presence of any flood defences are ignored, and covers land between Flood Zone 1 and Flood Zone 3.

- 2.1.20 There are no international, national or regional nature conservation sites within the Cable Route Corridor, however, locally designated nature conservation sites are present (Upton Grange Road Verges Local Wildlife Site (LWS), Willingham to Fillingham Road Verges LWS, and Cow Pasture Lane Drains LWS). The nearest SSSIs are Ashton's Meadow SSSI and Lea Marsh SSSI, located approximately 1.5km west and 6.5km northwest of the Cable Route Corridor respectively.
- 2.1.21 According to online mapping, the Cable Route Corridor is located within Grade 3 Agricultural Land Classification land, with the area primarily agricultural in use.
- 2.1.22 There are no Scheduled Monuments, Registered Parks and Gardens or Conservation Areas within the Cable Route Corridor. However, one Scheduled Monument, Fleet Plantation Moated Site, is located to the immediate south of the Cable Route Corridor at the existing National Grid Cottam Substation. There are a number of non-designated built heritage assets within the Cable Route Corridor and several Grade II Listed Buildings located on the edge of the Cable Route Corridor (e.g, Stow Park Station, Signal Box, Church of Holy Trinity and Font).
- 2.1.23 Three PRoW and three claimed PRoW cross the Cable Route Corridor within Lincolnshire (east of the River Trent) and there are nine PRoW within Nottinghamshire that will also be crossed by the route.

## 3. Scheme Description

### 3.1 The Scheme

3.1.1 The Scheme will comprise the construction, operation (including maintenance) and decommissioning of ground-mounted solar PV panel arrays and associated infrastructure to generate electricity. The solar PV panels will convert the sun's energy into electricity for export to the national electricity transmission network (also known as the National Grid) via an underground cable. The Scheme will import electricity from the national electricity transmission network through the provision of BESS.

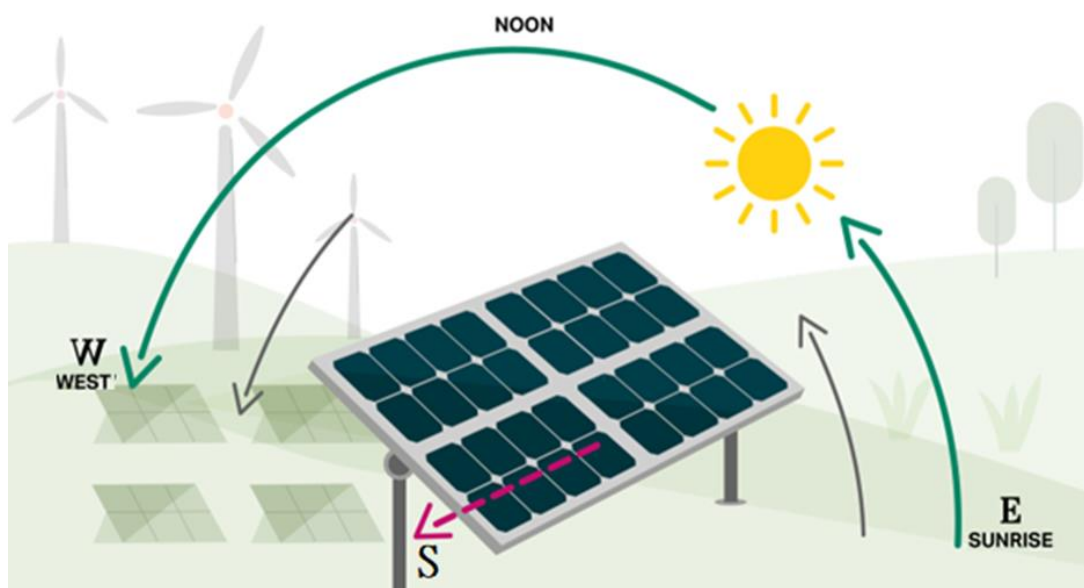
3.1.2 **Chapter 3: Scheme Description** of the Environmental Statement [EN010142/APP/6.1] provides a detailed description of the Scheme, a summary of which is presented below.

### 3.2 Principal Site

3.2.1 The Principal Site will primarily comprise solar panels, which will convert solar energy into electricity for storage on-site and then export to the National Grid at the National Grid Cottam Substation via the Cable Route Corridor.

3.2.2 The solar panels will be mounted on a single axis tracker, oriented north to south. This means that the solar panels will be able to move from east to west during the course of the day to follow the sun as it moves through the sky, as illustrated on [Plate 3-1](#). These 'tracker panels' are more efficient than 'fixed panels' that are unable to move to follow the sun.

**Plate 3-1: Illustration of Single Axis Tracker Solar Panel**



3.2.3 The solar panels, as well as associated infrastructure for energy storage, will be located across the Principal Site. However, land will be retained around the Principal Site for landscape planting, biodiversity enhancements and

setbacks from areas of existing woodland and utilities. Solar panels will therefore not be installed up to the edge of the Order limits or covering the full extent of the Principal Site.

3.2.4 The exact locations and specifications of solar panels and other associated infrastructure have not yet been determined and will only be decided upon when the detailed design of the Scheme is completed, which will occur after determination of the DCO Application. Therefore, for the purposes of the Environmental Statement, where flexibility needs to be retained until the detailed design work is complete, conservative assumptions have been used that provide for a reasonable 'worst-case' scenario. This approach is referred to as the 'Rochdale Envelope'. The Indicative Principal Site Layout Plan (**Figure 3** of this Non-Technical Summary) has been created to provide a visual representation of the distribution of solar PV panels and associated infrastructure across Principal Site that could be constructed within the defined maximum design parameters.

3.2.5 Within the Principal Site the Scheme is anticipated to comprise the following components:

- a. **Solar panels:** these convert sunlight into electrical current. The highest part of the solar panel will be a maximum of 3.5m above ground level. The solar panels will be mounted on structures in rows (also called 'strings'). Each string will sit between approximately 1.6m and 3.8m apart.
- b. Associated infrastructure for the conversion of electricity ready for export will include **inverters**<sup>6</sup>, **transformers**<sup>7</sup> and **switchgear**<sup>8</sup>. This infrastructure will be housed either separately or together in a container unit or similar within a **Solar Station**. The maximum height of these structures would be 3m.
- c. **BESS** (expected to be formed of lithium-ion batteries storing electrical energy) will be required within the Principal Site. The BESS will be spread across the Principal Site and co-located alongside the Solar Stations. Each BESS Battery container will be a maximum of 12.5m in length, 3m in width and 4m in height.
- d. Up to 140 **BESS and Solar Stations** will be located across the Principal Site. The maximum area for each grouping of BESS and Solar Station will be 48m in length by 30m in width and 4m in height. Note these dimensions do not represent a fully built out form, but set out the dimensions for an area within which various individual components will be located.
- e. Two **on-site substations** comprising a switchgear building, switch rooms and a control building. The on-site substation footprint is up to 108m in width by 115m in length with a concrete access track and crushed stone hardstanding throughout. The 400kV switchgear building will be up to 43m in length by 15m in width by 10m in height. The 33kV switch rooms will be up to 20m in length by 5m in width by 6m in height.

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<sup>6</sup> Inverters convert direct current (DC) electricity collected by the solar modules into alternating current (AC).

<sup>7</sup> Transformers control the voltage of the electricity generated across the Principal Site.

<sup>8</sup> Switchgear comprises a combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.

The control building would be around 25m in length by 18m in width by 7m in height. Four car parking spaces will be provided within each of the substation fenced areas for staff parking associated with routine and emergency maintenance.

- f. A **Solar Farm Control Centre**, which will allow around 10 to 12 staff to operate and maintain the site during day shifts only. The Solar Farm Control Centre will be a maximum of 20m in length, 15m in width and 6m in height. Ancillary and associated parking and servicing areas to the Solar Farm Control Centre will be located adjacent to the building.
- g. An **equipment storage building** comprising storage containers or an open storage area of approximately 1,200m<sup>2</sup>. The storage containers will be a maximum of 12m in length, 2.5m in width and 3m in height. The Scheme would require the provision of a maximum of 40 storage containers for use. Alternatively, an open storage area may be used for spare parts that would be covered by an open-sided 3.2m high canopy.
- h. On-site **buried high and low voltage cabling** to connect the solar panels, BESS and associated infrastructure.
- i. Other features such as internal access roads, drainage, fencing, lighting and CCTV within operational areas.
- j. Landscaping including habitat creation areas.

## Landscaping and Habitat Creation

- 3.2.6 The Indicative Principal Site Layout Plan (refer to **Figure 3** of this Non-Technical Summary) sets out the broad location of key components of the Scheme alongside the provision of green infrastructure. This includes proposed areas for planting and potential areas for ecological enhancement (referred to as Biodiversity Zones), and the provision of new hedgerows for mitigation. The Indicative Principal Site Layout Plan also shows those areas within the Principal Site where existing woodland and hedgerows will be retained.
- 3.2.7 The areas under the solar panels and areas outside the Biodiversity Zones will be planted with semi improved or species rich grassland where suitable, and hedgerows and woodland will be planted in strategic locations to provide visual screening and to enhance the biodiversity value and connectivity of the Principal Site.
- 3.2.8 In addition, the Principal Site includes 26 areas of Sensitive Archaeological Sites, which have been excluded from built development and photovoltaic panels to preserve the archaeological remains. These areas are defined to include a sufficient buffer to avoid construction impacts to the buried archaeological remains or extant earthworks. These areas will be sown with a species-rich grassland mix to create a permanent grass cover and each of the Sensitive Archaeological Sites will be demarcated with fencing to prevent entry and accidental damage during construction, operation and decommissioning of the Scheme.
- 3.2.9 The Principal Site will also provide two permissive paths for walkers, cyclists, and horse riders in an area where such routes are relatively limited. These permissive paths will be within 25 m wide corridors to allow the incorporation

of habitats such as hedgerows that will screen the solar infrastructure, create new green infrastructure corridors and provide interest to users.

3.2.10 In summary, across the Principal Site, the following areas of planting will be provided:

- a. Native grassland planting within areas of solar panels, Biodiversity Zones and Sensitive Archaeology Areas: over 1,000ha;
- b. Woodland planting: over 40ha; and
- c. New species rich hedgerow planting: over 10km.

3.2.11 The **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]** sets out the principles for how the land will be managed throughout the operational phase following the completion of construction. A detailed Landscape and Ecological Management Plan will be produced following the granting of the DCO and prior to the start of construction (this will be secured by a Requirement attached to the DCO).

### 3.3 Cable Route Corridor

3.3.1 The electricity generated by the Scheme is to be exported via 400 kilovolt (kV) buried cables within the Cable Route Corridor, from the on-site substations to National Grid Cottam Substation. The Cable Route Corridor will be directed across open countryside and requires crossings of the railway, watercourses, various utilities, and roads.

3.3.2 The total length of the cable run for the Cable Route Corridor will be approximately 18.5km. In general, aside from crossings of watercourses and other obstacles, it is anticipated that the Cable Route Corridor will be installed up to a maximum of 2m below ground level and the trench width of up to a maximum 3.5m. For trenchless crossings this will be deeper for construction purposes with a maximum of 5m below utilities, and up to 10m below National Rail infrastructure. For watercourses, the minimum depth is 2m and maximum depth is 5m. This is with the exception of the River Till and the River Trent where cables will be installed at a minimum of 5m below the bed to prevent disturbance to fish species, and a maximum depth of 25m, depending on the ground investigation results.

### 3.4 Temporary impacts on Public Rights of Way and Roads

3.4.1 There are 12 Public Rights of Way (PRoW) and three claimed PRoW that cross the Cable Route Corridor, and one PRoW and one claimed PRoW within Principal Site. There will be temporary impacts on these PRoW the construction phase of the Scheme, however none of these PRoW will be closed or diverted permanently once the Scheme is operational. During the construction period all but one will either be diverted locally or will be managed with a banksman (or similar), meaning they can remain in use through construction. A temporary closure (estimated 4 weeks) of PRoW along the Torksey Ferry Road will be required for resurfacing works, with no viable diversion possible.

- 3.4.2 In order to facilitate the construction of the Cable Route Corridor, construction of the accesses, road upgrades to accommodate construction traffic (such as construction of passing bays), and delivery of abnormal loads, a number of partial and full road closures will be required. Full road closures are likely to be required along minor roads with low traffic volumes that are too narrow to leave a lane open. The maximum estimated duration of such closures would be 8 weeks.
- 3.4.3 Further information on the PRow management and road closures is provided within the **Framework Construction Traffic Management Plan [EN010142/APP/7.11]** and the **Framework Public Rights of Way Management Plan [EN010142/APP/7.16]**.

## 3.5 Highway Works

- 3.5.1 The following highway works are proposed as part of the Scheme:
- a. Within the Order limits:
    - i. Street works to facilitate cable installation works;
    - ii. Alteration of road layouts, including modifications to road markings and temporary removal of signage to facilitate abnormal load manoeuvres;
    - iii. Some private field accesses will be closed, whilst others will be retained and improved, resulting in alterations to road layout to accommodate their connections to local highways;
    - iv. Junction improvements at Junction of A631 Harpswell Lane with School Lane, Junction of A1500 Tillbridge Lane with Stow Park Road, and Junction of Stow Park Road with Wooden Lane;
    - v. Repair of existing carriageway at Torksey Ferry Road and Wooden Lane;
    - vi. Alteration of road layout to facilitate localised carriageway widening for construction vehicles on Fillingham Lane, South Lane, and Wooden Lane;
    - vii. Provision of new access points; and
    - viii. Construction of passing bays.
  - b. Off-site:
    - i. Implementation of local off-site highway improvements to accommodate abnormal loads travelling to the Principal Site, e.g. pavement protection, temporary removal of street furniture, vegetation clearance including overhanging trees and lifting overhead cables, as required.



## 3.6 Construction

### Construction Programme

- 3.6.1 Subject to the DCO for the Scheme being granted, the earliest construction could be completed is between late 2025 and late 2027, with operation of the Scheme targeted to commence in 2028.
- 3.6.2 The construction programme is expected to be between 24 – 36 months in duration. At this stage, it is considered that a construction programme of approximately 24 months would be achievable if the Scheme is built in one continuous phase. The final programme will be dependent on the final Scheme design and potential environmental constraints on the timing of the construction activities.

### Construction Activities

- 3.6.3 Construction works are envisaged to include the following activities:
- a. Principal Site preparation, to include:
    - i. Preparation of land for construction, including localised site levelling;
    - ii. Import of construction materials, plant and equipment to site;
    - iii. Establishment of the perimeter fence;
    - iv. Establishment of five temporary construction compounds within the Principal Site;
    - v. Construction of the internal access roads; and
    - vi. Marking out the location of the Scheme infrastructure.
  - b. Solar PV Array construction to include:
    - i. Import of components to the five temporary compound areas;
    - ii. Erection of solar panel mounting structures;
    - iii. Mounting of panels;
    - iv. Trenching and installation of electric cabling;
    - v. Transformer, inverter and switchgear foundation excavation and construction;
    - vi. Installation of transformers, inverters and switchgears; and
    - vii. Installation of control systems, monitoring and communication equipment.
  - c. Construction of on-site Electrical Infrastructure:
    - i. Site preparation and civils for the on-site substations;
    - ii. Trenching and installation of electric cabling;
    - iii. Pouring of the concrete foundation base;
    - iv. Import of components to site – cranes will be used to lift the components into position; and
    - v. Installation of the substations.

- d. Cable installation to include:
  - i. The establishment of mobilisation areas and haul roads;
  - ii. Stripping of topsoil in sections;
  - iii. Trenching in sections (trenching and installation of electric cabling, including across watercourses);
  - iv. Appropriate storage and capping of soil;
  - v. Appropriate construction drainage with pumping where necessary;
  - vi. Sectionalised approach of duct installation;
  - vii. Excavation and installation of jointing pits and link box pits;
  - viii. Cable joint installation; and
  - ix. Cable pulling.
- e. BESS Construction:
  - i. Import of components to site;
  - ii. Installation of electric cabling;
  - iii. Construction of foundations; and
  - iv. Installation of batteries.
- f. Testing and commissioning.
- g. Site reinstatement.
- h. Habitat Creation.

## Site Access

- 3.6.4 Measures to control the routing and timing of staff vehicles are set out in the **Framework Construction Traffic Management Plan [EN010142/APP/7.11]**. Heavy Goods Vehicle (HGV) movements will be restricted to certain routes and times of day (outside of the network morning and afternoon peak periods) to reduce the impact on the local high network. In addition, a Delivery Management System will be implemented to control the bookings of HGV deliveries. This will be used to regulate the arrival times of HGVs.
- 3.6.5 The main construction access points to the Principal Site will be off the A631, which is located along its northern boundary and a single point of access off Middle Street (B1398). In addition, there will be four secondary, internal accesses for construction, operation and decommissioning, two off School Lane and two off Common Lane and two accesses provided for emergency use only during operation, both off Common Lane. An additional 24 access points are also proposed for the construction of the Cable Route Corridor.
- 3.6.6 Abnormal Indivisible Loads<sup>9</sup> be required for the delivery of infrastructure associated with the on-site substations and for cable drum deliveries along the Cable Route Corridor.

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<sup>9</sup> Abnormal Indivisible Loads means a load that cannot without undue expense or risk of damage be divided into two or more loads for the purpose of being carried on a road.

- 3.6.7 The peak and average daily number of HGVs and Light Goods Vehicles (LGVs) required for the Principal Site are identified below. To provide a robust assessment, the peak forecast numbers account for daily variation and peak daily movements:
- a. Peak – 120 HGV deliveries (240 movements per day) and 60 LGV deliveries (120 movements per day);
  - b. Average – 65-70 HGV deliveries (130-140 movements per day) and 30-35 LGV deliveries (60-70 movements per day).
- 3.6.8 The peak and average daily number of HGVs required for the Cable Route Corridor are identified below. To provide a robust assessment, the peak forecast numbers account for daily variation and peak daily movements:
- a. Peak – 272 HGV deliveries (544 movements per day); and
  - b. Average – 186 HGV deliveries (372 movements per day).
- 3.6.9 Four separate car parks providing a capped total of 500 car parking spaces for construction staff will be provided and accessed via the three existing accesses on the A631 and via the B1398 (Middle Street). A mini-bus/coach service will be provided to pick-up and drop-off construction staff to transport them to/from the site to ensure the cap on the car parking spaces is not exceeded. The construction staff that are working on the Cable Route Corridor will travel directly to the compound closest to the section they are working on.

## **Construction Compounds**

- 3.6.10 Five temporary construction compounds will be located within the Principal Site. These will include compounds for the construction of PV solar infrastructure, on-site substations and the 400kV cable. The construction compounds will contain offices, mobile welfare units, canteens, storage and waste skips, construction staff car parking areas and space for storage, download and turning area.
- 3.6.11 Six construction compounds will also be required along the Cable Route Corridor to facilitate its construction. These compounds will comprise site offices, storage containers, laydown areas, parking, welfare units and waste sorting areas.

## **Construction Staff**

- 3.6.12 At the peak of construction (based on the most rapid possible build out of 24 months as a worst-case scenario), up to 1,395 staff per day will be required to work across the Scheme.

## **Construction Working Hours**

- 3.6.13 Core working hours on-site will run from 7am until 7pm Monday to Friday and 7am to 1pm on Saturday. All deliveries (including those delivered by HGVs) would be within core working hours. All construction staff travel to and from the Order limits would be the hour before and after core working hours (i.e. outside of rush hour). The Scheme will also implement a monitoring system to record HGVs travelling to and from the Scheme, to record any

non-compliance with the agreed routing plan/delivery hours and to communicate any issues to the relevant suppliers to ensure the correct routes are followed. A **Framework Construction Traffic Management Plan [EN010142/APP/7.11]** has been prepared to manage the impacts of construction traffic associated with the Scheme.

## Construction Controls

- 3.6.14 The construction phase will be subject to management documents which will limit and control activities. The outline documentation produced with the DCO Application to mitigate effects associated with this phase includes:
- a. **Framework Construction Environmental Management Plan [EN010142/APP/7.8];**
  - b. **Framework Construction Traffic Management Plan** (including an Abnormal Indivisible Loads Management Plan) **[EN010142/APP/7.11];**
  - c. **Framework Soil Management Plan [EN010142/APP/7.12];** and
  - d. **Framework Public Rights of Way Management Plan [EN010142/APP/7.16].**
- 3.6.15 In addition, in order to maximise local benefits from employment a **Framework Skills, Supply Chain and Employment Plan [EN010142/APP/7.18]** has been produced.
- 3.6.16 The production of detailed versions of these plans will be secured through DCO requirements, meaning that they must be in place before development can lawfully begin.

## 3.7 Operation

- 3.7.1 Once the Scheme has been constructed and is operational, activity will be minimal and will be restricted principally to vegetation management; equipment maintenance and servicing; replacement of any components that fail; and monitoring to ensure continued effective operation of both the Scheme and the associated environmental mitigation measures.
- 3.7.2 Along the cable route, operational activity will consist of routine inspections (schedule to be determined) and any reactive maintenance such as where a cable has been damaged.
- 3.7.3 It is anticipated that there will be up to 10-12 permanent staff located on-site once the Scheme is operational,, which as a worst-case scenario would generate up to 12 vehicles (24 movements) per day. In addition, there is forecast to be an average of five visits per week (one trip per day) from four-wheel drive vehicles, HGVs or transit vans for maintenance.
- 3.7.4 If full panel and BESS replacement is required at some point during the lifetime of the Scheme, activity would be considerably less intensive than during construction, and is anticipated to generate approximately 10% of the daily HGV/coach and car/LGV movements estimated to be generated during peak construction of the Principal Site and Cable Route Corridor.
- 3.7.5 The water supply for the Solar Farm Control Centre will come from the mains supply and disposal will be to a cess pit emptied by specialist licenced

contractor. Water supply for more extensive operational activities (e.g. panel cleaning) will be delivered to the Principal Site from third party supplies, so as not to put stress on local water supply.

- 3.7.6 Operational access will be taken from three access points on the A631 Harpswell Lane and one access point on the B1398 Middle Street.
- 3.7.7 A **Framework Operational Environmental Management Plan** has been produced as part of the DCO Application [EN010142/APP/7.9] to demonstrate how any mitigation and management measures will be implemented. In addition, landscaping will be managed in accordance with the **Framework Landscape and Ecological Management Plan** [EN010142/APP/7.17]. Operational safety risks will be managed in accordance with the **Framework Battery Safety Management Plan** [EN010142/APP/7.13]. The delivery of detailed versions of these plans will be secured through DCO requirements.

## 3.8 Decommissioning

- 3.8.1 The design and operational life of the Scheme is 60 years, with decommissioning expected to commence thereafter. During this period, the existing agricultural will lay undisturbed beneath the panel infrastructure, enabling it to recover from previous farming and ultimately safeguarding the agricultural usage of this land for future generations.
- 3.8.2 Decommissioning is expected to take between 12 and 24 months and will be undertaken in two phases. The first phase would remove the above ground structures followed by the second phase for the removal of below ground elements of the Scheme.
- 3.8.3 All solar panels, mounting structures, structures, foundations, cabling, inverters and transformers will be removed and recycled or disposed of in accordance with good practice and market conditions at that time. This is with the exception of the cabling in the Cable Route Corridor, which may remain in-situ. Along with the cabling, the future of the substations and the Solar Farm Control Centre building would be agreed with the relevant Local Planning Authority prior to commencement of decommissioning.
- 3.8.4 The specific method of decommissioning the Scheme at the end of its operational life is uncertain at present as the engineering approaches to decommissioning will evolve over the operational life of the Scheme. Decommissioning would be undertaken safely and with regard to the environmental legislation at the time of decommissioning, including relevant waste legislation.
- 3.8.5 The effects of decommissioning are usually similar to, or of a lesser magnitude than, construction effects.
- 3.8.6 The decommissioning phase will be subject to management documents which will limit and control activities. The outline documentation produced with the DCO Application to mitigate effects associated with this phase includes the **Framework Decommissioning Environmental Management Plan** [EN010142/APP/7.10]. Again, the delivery of detailed versions of this plan will be secured through DCO requirement.

## 4. Design Evolution and Alternatives

### 4.1 Overview

- 4.1.1 **Chapter 4: Alternatives and Design Evolution** of the Environmental Statement [EN010142/APP/6.1] describes the consideration of alternatives and the design evolution in relation to the Scheme. The reasons for the selection of the Principal Site and Cable Route Corridor are also explained.
- 4.1.2 Solar power addresses all important aspects of existing and emerging Government energy policy. It will make a critical and timely contribution to decarbonisation and security of supply in the UK. The national need for solar generation is urgent and the capacity required is significantly greater than the capacity of projects currently understood to be in development. The Scheme has a vital role to play on the national and world stage in the urgent response to tackle climate change.

### 4.2 Site Selection

#### Principal Site

- 4.2.1 A five-stage site selection process was undertaken to identify suitable sites and ultimately select the Principal Site. The four stages comprised:
- a. **Stage 1 – Determining Initial Areas of Search:** This stage considered irradiation (sunlight) and topography and a point of connection to the National Grid;
  - b. **Stage 2 – Refining the Area of Search:** This stage considered environmental and planning constraints (such as internationally and nationally designated ecological and geological sites) to exclude areas/sites from within the Area of Search;
  - c. **Stage 3 – Identifying potential solar Development Zones:** This stage sought to identify zones potentially suitable for solar development by identifying contiguous sites to allow the development of a cohesive design. Areas of land capable of delivering a contiguous site of at least 930ha were taken forward to Stage 4;
  - d. **Stage 4 – Further evaluation of zones considered suitable for solar development:** This stage included a desktop assessment of the zones identified by Stage 3 in terms of their suitability for a large-scale solar Scheme. The criteria included the suitability of each zone against potential impacts associated with:
    - i. Ecology and biodiversity;
    - ii. Landscape and visual;
    - iii. Land Use; including PRow;
    - iv. Cultural heritage;
    - v. Access for construction vehicles;
    - vi. Field shading;
    - vii. Deliverability of grid connection; and

- viii. Terrain.
  - e. **Stage 5 - Identification of Principal Site within Zone A to form the basis of the DCO Application:** This considered the availability of land with respect to landownership and further two stages of constraints analysis.
- 4.2.2 The assessment undertaken at Stage 4 is shown **Table 4-3** of **Chapter 4: Alternatives and Design Evolution** of the Environmental Statement **[EN010142/APP/6.1]** and concluded that all zones performed well against the criteria and would be suitable for the Scheme albeit with some zones slightly more constrained than others. The least constrained zone (Zone A) was recommended for further consideration as the preferred location for the Scheme. This zone included land to the east and south-east of Gainsborough, which the Principal Site is located within.
- 4.2.3 Following discussions with landowners within zone A and the need to identify a contiguous site to support good design, an initial area of land measuring approximately 2,600ha was identified to the south-east of Gainsborough for further consideration.
- 4.2.4 Preliminary constraints mapping was undertaken during Stage 5. The outcome of the constraints mapping is shown in **Figure 4** of this Non-Technical Summary. This exercise also produced other buffers/exclusion zones in which solar development was not considered suitable within the 2,600ha area. From this constraints assessment, including the consideration of landscape and visual effects (**Figure 5** of this Non-Technical Summary), a reduced Principal Site area of approximately 1,500ha was derived where areas of land suitable for development were identified.

## Cable Route Corridor

- 4.2.5 A project inception meeting was held with the Planning Inspectorate on 11 July 2022. At this meeting, the Planning Inspectorate requested a discussion on collaboration with other developers who were also bringing forward other NSIPs in the locality. The Planning Inspectorate then hosted a multi-party meeting between the host local authorities and the Applicants of the other solar NSIP projects including the **Gate Burton Energy Park [EN010131]**, the **Cottam Solar Project [EN010133]**, the **West Burton Solar Project [EN01032]** and the **Tillbridge Solar Project [EN010142]** on the 30 September 2022. At this point, the Applicant agreed to collaborate with the other developers to consider how the Tillbridge Solar Project could interact with the projects within the already agreed shared corridor.
- 4.2.6 The Order limits associated with Cable Route Corridor have been designed to avoid, where practicable, sensitive receptors such as the Local Wildlife Sites, woodland, heritage assets and their setting, residential and commercial properties, and to minimise the number of affected land interests. The Cable Route Corridor design has been refined and reduced in width as far as possible having regard to the space requirements along the route for up to four large-scale solar projects (Gate Burton Energy Park, Cottam Solar Project, West Burton Solar Project and the Scheme) should all DCOs be consented. On this basis there is a need to retain some flexibility to

ensure that no project prevents another project coming forward should all DCOs be consented.

4.2.7 The selection of the cable route has considered the following criteria:

- a. Operational and engineering requirements (such as space requirements and access);
- b. Planning and environmental constraints (such as cultural heritage and ecological features and approved developments);
- c. Other land use and landownership constraints (such as the number if affected landowners).

## 4.3 Alternative Layouts

### Principal Site

4.3.1 The layout of the Scheme has evolved taking into consideration environmental effects, the Scheme's objectives and functionality, and feedback from stakeholders including through the statutory consultation process. Key changes to the design have included:

- a. Where practical, locating structures such as BESS, Solar Stations and on-site substations on non-Best and Most Versatile agricultural land, as defined under the National Planning Policy Framework (Ref. 5), and outside of areas of highest flood risk (Flood Zones 2 and 3);
- b. A minimum of 250m radius separation distance provided between residential properties and indicative locations of BESS, Solar Stations and on-site substations;
- c. Providing buffers around residential properties from the Solar PV Areas, with woodland mitigation where appropriate, but also cognisant of residents' appreciation of open views. These buffers vary from around 30m (where existing dense screening is in place) or more generally a minimum of 50m, up to around 300m;
- d. Removal of field parcels within the north-eastern part of the Principal Site from the Order limits due to their proximity to designated heritage assets;
- e. Adjustments to the Order limits to reflect land referencing and landowner discussions;
- f. Inclusion of two permissive paths to enhance recreational routes within the area;
- g. Introduction of Special Archaeological Sites to retain potential archaeology in situ and to exclude development; and
- h. The inclusion of additional landscape and ecological enhancement areas (Biodiversity Zones) to provide connectivity for wildlife and to soften the Scheme between the Solar PV areas and the adjoining agricultural fields.



## Cable Route Corridor

- 4.3.2 There are three proposed areas of optionality within the Cable Route Corridor that are accommodated by the Scheme, including:
- a. Two alternative routes at land to the south of Marton due to concerns associated with space for all four Schemes and concern associated with land acquisition rights that has emerged through the Gate Burton Energy Park examination;
  - b. Two alternative routes to land to the east of Marton due to the need to cross a live railway line using a trenchless crossing, to protect an existing woodland, to protect a gas pipeline owned by Uniper, and where the Cottam Solar Project also crosses the railway line at this point; and
  - c. Two alternative routes to land to the east of Willingham-by-Stow where the eastern option is required to extend through the proposed Solar PV area of the Cottam Solar Project thereby retaining an alternative option to the west given this constraint.
- 4.3.3 These locations are shown in **Figure 6** of this Non-Technical Summary.

## 4.4 Alternative Solar Design Technologies

### Solar PV Panel Technology

- 4.4.1 Fixed south facing solar panels, whilst most commonly used in solar facilities to date in the UK, are set at the height they are installed. This compares to the changing orientation and height of east-west tracker panels.
- 4.4.2 The Scheme will use east-west single access tracker solar panels. These provide a lower panel height during most of the day and at night therefore potentially have a lower visual and landscape impact when compared to the other options, while also maximising the irradiance levels by continuously tracking the Sun's trajectory throughout the day. The east-west trackers can also allow more flexibility to work around some environmental limitations which pose a physical constraint.

### Battery Storage Arrangements

- 4.4.3 There are two options available for the way in which PV panels can connect/couple with the BESS:
- a. **Option 1 – Alternating Current (AC)-coupled** which results in batteries being located within a centralised part of the Principal Site located away from the PV panels, or
  - b. **Option 2 – Direct Current (DC)-coupled** which results in batteries being dispersed across the Principal Site adjoining the proposed Solar Stations and associated fields of PV panels. This is the arrangement that will be used by the Scheme.
- 4.4.4 DC-coupled systems are more efficient than AC-coupled systems and a better solution for the grid import/export agreement offered by National Grid.
- 4.4.5 The dispersal of the BESS in a DC-coupled system provides a greater opportunity to assimilate this infrastructure within the Principal Site. With the

BESS being sited amongst the PV panels it will be easier to screen it alongside proposed landscape and ecological mitigation for the Scheme.

## 5. EIA Methodology

### 5.1 Topics Assessed

- 5.1.1 The environmental effects of the Scheme have been assessed during construction, operation, and decommissioning. A detailed description of the EIA methodology is set out within **Chapter 5: EIA Methodology** of the Environmental Statement [EN010142/APP/6.2].
- 5.1.2 The content or 'scope' of the EIA was agreed through the production of an EIA Scoping Report, which was submitted to the Planning Inspectorate<sup>10</sup> (refer to **Appendix 1-1** of the Environmental Statement [EN010142/APP/6.2]). Following the preparation of an 'EIA Scoping Opinion' by the Planning Inspectorate (included within **Appendix 1-2** of the Environmental Statement [EN010142/APP/6.2]), the following environmental topics have been assessed within topic specific chapters of the Environmental Statement:
- a. Air Quality;
  - b. Climate Change;
  - c. Cultural Heritage;
  - d. Ecology and Nature Conservation;
  - e. Water Environment;
  - f. Human Health;
  - g. Landscape and Visual Amenity;
  - h. Noise and Vibration;
  - i. Socio-Economics and Land Use;
  - j. Soils and Agriculture;
  - k. Transport and Access; and
  - l. Other Environmental Topics, including:
    - i. Glint and glare;
    - ii. Ground conditions;
    - iii. Major accidents and disasters;
    - iv. Telecommunications, television reception and utilities;
    - v. Materials and waste; and
    - vi. Electric and electromagnetic fields.

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<sup>10</sup> The Planning Inspectorate (also sometimes referred to as 'PINS') are the government agency responsible for examining DCO applications and making recommendations to the relevant Secretary of State about whether DCO for a Scheme should be granted.

- 5.1.3 The Environmental Statement also considers the potential for the Scheme to result in cumulative environmental effects with other current or planned developments in the vicinity of the Site.
- 5.1.4 Effect interactions, where two or more effects from the Scheme could be experienced by a resource or receptor have also been considered throughout the Environmental Statement.

## 5.2 Approach to Assessment and Terminology

- 5.2.1 A development of this nature is likely to have some effects on the environment, which are both beneficial and adverse. What is important is that 'significant' effects are identified and reduced through the design process, or through other mitigation measures.
- 5.2.2 The effects of the Scheme are described in terms of changes to the existing situation (the baseline) or anticipated situation in the future in the absence of the Scheme (the future baseline). EIA assesses environmental effects on resources (such as archaeology) and receptors (such as human beings or animals such as great crested newt). The significance of the environmental effects was assessed by judging the sensitivity (that is, the importance) of a resource or receptor against the magnitude (that is, the scale or extent) of the predicted impact from the Scheme. The duration and geographic scale of the effects were also taken into account.
- 5.2.3 The purpose of the EIA is to identify significant environmental effects that remain following the implementation of all identified mitigation measures to ensure that decision makers are able to make an informed judgement on the environmental impacts of a proposal before granting consent.
- 5.2.4 To enable comparison between technical topics and to aid understanding of the findings of the Environmental Statement, standard terms are used wherever possible to describe the relative significance of effects (i.e. 'major', 'moderate', minor', and 'negligible'). The effects are also described as being adverse or beneficial. Each of the technical chapters within the Environmental Statement [EN010142/APP/6.1] provides further description of the method that has been used to determine whether an effect is significant or not.
- 5.2.5 Typically, effects that are considered to be negligible or minor are judged to be 'not significant', whereas those that are moderate or major are 'significant'. As the design of the Scheme has evolved, the Applicant has worked with environmental specialists to ensure the design avoids or reduces environmental effects on receptors wherever possible through the use of embedded mitigation measures (meaning measures that form part of the design or methods for construction or operation), such as the use of environmental management plans. Following the incorporation of embedded mitigation, where the EIA predicts a significant adverse effect on one or more receptors, consideration is given to whether there are further additional mitigation measures which could avoid or reduce the effect further, or to reduce the likelihood of it happening. These measures are taken into account in the EIA and assessment of effects of the Scheme. Identified embedded and additional mitigation is secured through the DCO, should it be granted, and this is made clear in the Environmental Statement.

- 5.2.6 The remainder of this Non-Technical Summary sets out the findings of the Environmental Statement, on a topic by topic basis.

## 6. Findings of the Environmental Statement

### 6.1 Introduction

- 6.1.1 An assessment of the environmental effects of the Scheme during its construction, operation (including maintenance and repairs), and eventual decommissioning has been completed for each of the topics identified in paragraph 5.1.2 above.
- 6.1.2 The likely significant environmental effects of the Scheme are described within the **Environmental Statement [EN010142/APP/6.1]**. This section provides a brief summary of the overall findings of the Environmental Statement.

### 6.2 Air Quality

#### Introduction

- 6.2.1 **Chapter 6: Air Quality** of the Environmental Statement **[EN010142/APP/6.1]** presents the findings of an assessment of the likely significant effects on local air quality as a result of the Scheme. This section considers the potential for activities to change local air quality during the construction, operation, and decommissioning phases of the Scheme. The guidance and methods that have been used are widely applied in England to assess the likelihood of emissions to air affecting the health and amenity of the local community or conditions at designated ecological sites.
- 6.2.2 Air quality effects from operational road traffic were considered against the Institute of Air Quality Management (Ref. 6) and Environmental Protection UK (Ref. 7) screening criteria and identified as not requiring detailed assessment due to their very low levels. In addition, there are no emission sources from the Scheme during its operation and as such, the operational phase assessment was scoped out.

#### Baseline and Context

- 6.2.3 There are no Air Quality Management Areas declared in West Lindsey District Council or Bassetlaw District Council. West Lindsey District Council and Bassetlaw District Council undertake routine air quality monitoring at locations across the district. The closest monitoring stations are 4km south of the Order limits.
- 6.2.4 As no monitoring data was available within the vicinity of the Order limits, a three-month air quality monitoring survey was undertaken at nine roadside sites in the vicinity of the Order limits in 2022. This monitoring identified that existing air quality within and surrounding the Order limits is generally good and complies with the national air quality objectives set for the protection of human health. Department for Environment, Food and Rural Affairs' (DEFRA's) projections for future air quality predict that local air quality within

the vicinity of the Scheme will improve slightly further by the time that the construction of the Scheme would occur.

- 6.2.5 A background level of dust exists in all urban and rural locations in the UK. Dust can be generated on a local scale from vehicle movements and from the action of wind on exposed soils and surfaces. It is considered that existing local sources include wind-blown dust from exhaust emissions from energy plant and road vehicles, brake and tyre wear from road vehicles and the long-range transport of material.

## Mitigation and Monitoring

- 6.2.6 Standard good practice measures to manage the impacts from dust generation are included in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]** and the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**. These include measures such as avoiding stockpiling soil and materials near to the boundaries of the Order limits, using water to damp down soil if earthworks are undertaken in dry weather, and covering any dusty materials being transported on or off-site. These measures have a strong track record of controlling offsite effects of emissions to air effectively, where they have been applied to other construction sites over the last 20 years. The nature of the activities required to construct, operate and decommission the Scheme have limited potential to generate emissions to air and with the proposed good practice control measures there should be no change to future standard of air quality experienced by local communities, with or without the Scheme.

## Assessment of Effects

### Construction Effects

- 6.2.7 A Construction Dust Risk Assessment was carried out. With the implementation of the standard good practice measures during construction, the site was identified as having a “low risk” of impacts relating to dust soiling and human health effects. The standard good practice measures for implementation are included in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**. The effects of dust on health and amenity would be **not significant**.
- 6.2.8 An assessment of the likely impacts of emissions from construction traffic on local air quality has identified that construction vehicles would cause a negligible change to existing concentrations of air pollutants. The assessment also identified that local air quality would remain at the same good standard and well within the relevant national air quality objective values. It is predicted that effects from construction related vehicle emissions would be **not significant**.

### Operational Effects

- 6.2.9 There are no emission sources from the operation of the Scheme. In addition, the operational phase traffic is considered to be limited, as set out within Section 6.12 of this Non-Technical Summary. As such, an operational phase air quality assessment was scoped out from further consideration.

## Decommissioning Effects

- 6.2.10 The air quality effects during decommissioning will be similar to, if not less than, the construction phase. Decommissioning is expected to be shorter in duration, less intensive and with fewer road trips. The standard good practice measures included in the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]** would adequately minimise risks. Any impacts on health and amenity from air quality would be **not significant**.

## 6.3 Climate Change

### Introduction

- 6.3.1 **Chapter 7: Climate Change** of the Environmental Statement **[EN010142/APP/6.1]** presents the findings of an assessment of the likely significant effects of the Scheme on the climate. This includes consideration of the Scheme's contribution to greenhouse gas (GHG) emissions and the potential effects of climate change both on the Scheme itself and on surrounding receptors as a result of the Scheme. The assessment then provides information on proposed mitigation measures.
- 6.3.2 The climate change assessment includes the following three assessments:
- Lifecycle GHG impact assessment – to consider the impact of GHG emissions arising over the lifetime of the Scheme on the climate;
  - Climate change resilience assessment (CCRA) – to consider the resilience of the Scheme to the impacts of future climate change; and
  - In-combination climate change impact (ICCI) assessment – to identify how the resilience of receptors in the surrounding environment are affected by the combined impact of future climate conditions and the Scheme.

### Baseline and Context

- 6.3.3 The climate change assessment was completed in the context of the UK Government setting a legal target to achieve 'net zero' GHG emissions across electricity generation, industry, transport and domestic sources by 2050 (Ref. 8).

### GHG Assessment

- 6.3.4 A GHG assessment has been conducted which covers all direct GHG emissions arising from activities undertaken within the Order limits during the construction, operation (including maintenance), and decommissioning of the Scheme. It also includes indirect emissions embedded within the construction products (e.g. solar PV panels and cables) and materials (e.g. the steel required to construct the solar PV mounting structures) arising as a result of the energy used for their production, as well as emissions arising from the transportation of products and materials, waste, and construction workers. While it is important to understand the GHG impacts at each individual lifecycle stage, it is also important to understand the net lifecycle GHG impact of the Scheme due to the long-term, cumulative nature of GHG emissions of the lifetime of the Scheme. Therefore, the net impact of the

Scheme is also identified and assessed, taking into account the renewable energy generation throughout the Scheme's operation.

- 6.3.5 The receptor for the lifecycle GHG impact assessment is the global climate.
- 6.3.6 The baseline and future baseline for GHG emissions is a 'business as usual' scenario where the Scheme does not go ahead. While the current land use within the Order limits will have minor levels of associated GHG emissions, it is anticipated that these emissions will not be material in the context of the overall Scheme. Therefore, for the purposes of the lifecycle GHG impact assessment, a GHG emissions baseline of zero was applied.

### **Climate Change Resilience (CCR) Assessment**

- 6.3.7 The CCR assessment provides a risk assessment framework to consider vulnerability of the Scheme to climate change and assesses the likelihood of a climate change risk occurring and the consequence if the hazard occurs.
- 6.3.8 The receptor for the CCR assessment is the Scheme itself, including all infrastructure, assets, and workers on-site during construction, operation, and decommissioning.
- 6.3.9 The current baseline for the CCR assessment is the climate in the location of the Scheme for the 30-year period of 1981 to 2010 (the standard baseline for climate data). This is based on historic climate data recorded by the closest Met Office station to the Scheme (Scampton) for the 30-year climate period of 1981 to 2010 (Ref. 9).
- 6.3.10 The future baseline is expected to differ from the present-day baseline. These have been calculated using the United Kingdom Climate Projections 2018 (UKCP18) (Ref. 10).

### **In-combination Climate Change Impact (ICCI) Assessment**

- 6.3.11 The IICCI assessment follows the principles set out for the CCR assessment but considered the potential impacts on environmental resources or receptors identified within other topic chapters.
- 6.3.12 The current and future baselines for the ICCI assessment are as described for the CCR assessment.

## **Mitigation and Monitoring**

### **GHG Assessment**

- 6.3.13 A range of mitigation measures has been embedded into the Scheme to mitigate the impacts of the Scheme on the climate. Measures in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]** and the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]** to reduce GHG emissions include but are not limited to: increasing recyclability, minimising waste creation and maximising use of low carbon materials, reusing infrastructure and resources where possible, reducing the number of construction staff and employee trips, switching vehicles and plant off when not in use, conforming to vehicle emissions standards, and conducting regular maintenance of plant and machinery to optimise efficiency.

## CCR and ICCI Assessments

- 6.3.14 In addition, multiple measures have been embedded into the Scheme design to mitigate the impacts of climate change on the Scheme and the in-combination impacts on nearby receptors. These impacts will be reduced through the consideration of future climate conditions, with measures for flood risk summarised in Section 6.6 Water Environment of this Non-Technical Summary being of particular relevance. In addition, construction mitigation measures are outlined in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]** which include measures related to managing adverse weather conditions. No additional mitigation measures or enhancements are required.

## Assessment of Effects

### GHG Assessment

- 6.3.15 The greatest GHG emissions occur during the construction phase as a result of the manufacture of the materials and components required to build the Scheme, in particular the solar PV panels and BESS. Other sources of GHG emissions include water, energy and fuel use for construction activities, transportation of materials and workers to and from the Order limits and the transportation and disposal of waste.
- 6.3.16 GHG emissions sources within the scope of the operational emissions include operational energy use (i.e. for auxiliary services and standby power), fuel used for the transportation of workers to and from the Order limits, and maintenance activities (including embodied carbon in replacement parts, plant and machinery requirements, fuel and water use during maintenance activities, transportation of material and waste transport from the Order limits).
- 6.3.17 GHG emission sources within the scope of decommissioning emissions include the use of plant, worker travel and waste, which replicate the emissions produced during the construction phase. Emissions from the disposal and recovery of materials and components at the end of the Scheme's design life were also estimated.
- 6.3.18 The Scheme has very low emissions relative to the UK carbon budget totals and the sectoral carbon budgets for electricity supply. Albeit, the construction, operation and decommissioning of the Scheme will inevitably result in some residual emissions by 2050. The vast majority of these residual emissions are operational emissions.
- 6.3.19 The Scheme will achieve substantial emissions reductions compared to the without-project baseline. When considering whole life carbon emissions, the Scheme would represent a saving of over 15 million tonnes of carbon dioxide equivalent (CO<sub>2</sub>e) emissions, compared to a scenario where the same amount of energy was produced by the most carbon-efficient fossil-fuelled technology currently available, a Combined Cycle Gas Turbine. The use of the BESS provides an opportunity for additional carbon savings. For example, the additional use of BESS for grid balancing purposes could save a further 18 million tonnes of CO<sub>2</sub>e total when compared to Open Cycle Gas Turbines, which perform a similar function of grid balancing. This is considered to present a **significant beneficial effect**. The GHG savings



achieved throughout the lifetime of the Scheme demonstrate the role solar energy generation has to play in the transition to, and longer-term maintenance of, a low carbon economy in the UK.

### CCR Assessment

- 6.3.20 Future climate change projections were reviewed and the sensitivity of the Scheme's assets to the impacts of a changing climate was examined. This review considered the adequacy of the CCR measures built into the Scheme and whether they are sufficient to mitigate potential significant effects on the Scheme's assets. As a result of the proposed mitigation measures, **no significant** climate change risks during the construction, operation, or decommissioning phase were identified.

### ICCI Assessment

- 6.3.21 Future climate change projections were reviewed and the sensitivity of identified sensitive receptors to these hazards examined as part of the ICCI Assessment. **No significant** effects as a result of the effects of the Scheme combined with the impacts of climate change are anticipated.

## 6.4 Cultural Heritage

### Introduction

- 6.4.1 **Chapter 8: Cultural Heritage** of the Environmental Statement [EN010142/APP/6.1] presents the assessment of the likely significant effects of the Scheme on the cultural heritage resource. Cultural heritage comprises all aspects of the environment resulting from the interaction and relationships between people and places through time, including built heritage and archaeology. Heritage assets include buildings, monuments, sites, places, areas or landscapes identified as having a degree of value due to their heritage interest.

### Baseline

- 6.4.2 The baseline for cultural heritage was identified through completion of a desk-based assessment, which included a walkover survey to view heritage assets and the historic landscape in the vicinity of the Scheme, and a programme of non-intrusive survey and intrusive archaeological evaluation. The desk-based assessment was informed by data collected from various sources, including the Historic Environment Record (HER) and Historic England's National Heritage List for England (NHLE). The programme of archaeological surveys and evaluation included a geophysical survey and geoarchaeological borehole survey and deposit modelling of the area within the Order limits, and archaeological trial trench evaluation of the Principal Site.
- 6.4.3 There are no World Heritage Sites, Registered Battlefields, or Protected Wrecks within the Order limits or within 5km radius. In addition, there are no designated heritage assets comprising scheduled monuments, listed buildings, and conservation areas within the Order limits. Within 3km of the Order limits, there are 186 designated heritage assets, comprising:
- a. 17 scheduled monuments;

- b. Four conservation areas (Glenworth, Hemswell, Springthorpe and Fillingham);
  - c. 163 listed buildings (15 Grade I, 11 Grade II\* and the remainder Grade II); and
  - d. Two Grade II Registered Park and Gardens (Fillingham Castle and Norton Place).
- 6.4.4 In addition, there are a total 422 non-designated assets recorded within 1km radius of the Order limits (excluding findspots), with 55 located within the Principal Site and 23 within the Cable Route Corridor. These include but are not limited to, monuments, archaeological sites and buildings which are not recorded as designated heritage assets. There is potential for unknown archaeological remains, deposits, scatters and artefacts within and adjacent to the Order limits, ranging from prehistoric palaeoenvironmental deposits to Romano-British and Anglo-Saxon archaeological remains to medieval features and post-medieval farmsteads.
- 6.4.5 The historic landscape character within the Order limits is predominantly agricultural, with elements of medieval open fields and early enclosure surviving within the later enclosure fields of the 18<sup>th</sup> and 19<sup>th</sup> centuries, which in some areas themselves survive as part of the large, regular fieldscape of the 20<sup>th</sup> century. Within Lincolnshire, the Order limits are located within two historic landscape character zones, with the majority located within historic landscape character zone NCL3: The Northern Cliff and the eastern edge located within historic landscape character zone TVL:1 The Trent Valley. Within Nottinghamshire, the Cable Route Corridor passes through five historic landscape character types; Patterns reflecting open fields, Regularly laid out large geometric field patterns, Irregular geometric field patterns, Semi-regular field patterns; and Urban Areas.
- 6.4.6 In addition, a total of 30 historic important hedgerows and one potentially important hedgerow are located within the Order limits.

## Mitigation and Monitoring

- 6.4.7 Where practicable, embedded mitigation measures have been incorporated into the Scheme design and/or management measures for the construction and decommissioning phases. Through iterative assessment, potential impacts have been predicted and opportunities to mitigate them identified with the aim of preventing or reducing impacts as much as possible.
- 6.4.8 Landscape planting which has been designed to screen views to or from some heritage assets is illustrated on **Figure 3** of this Non-Technical Summary. This is secured through the **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]** within the DCO Application.
- 6.4.9 Embedded mitigation measures specifically related to cultural heritage include:
- a. The establishment of 26 Sensitive Archaeology Sites (see **Figure 3** of this Non-Technical Summary and **Table 8-8** of **Chapter 8: Cultural Heritage** of the Environmental Statement [EN010142/APP/6.1]), which

have been excluded from development to preserve the archaeological remains;

- b. Appropriate setbacks have been incorporated into the Scheme design, with buffer areas included around non-designated historic farmsteads within the Principal Site to ensure they are excluded from the Scheme, although they may still incur setting impacts. These buffers vary from around 30m (where existing dense screening is in place) or more generally a minimum of 50m up to around 300m.
  - c. Establishment of 20m buffer zones around Fleet Plantation scheduled monument.
  - d. The use of trenchless crossings rather than open cut trenching for the avoidance/preservation of buried peat deposits of potential Neolithic date within the floodplain of the River Trent and areas of Iron Age and Romano-British enclosures, field system and trackway east of Cow Pasture Lane, Cottam.
  - e. Changing the Order limits in the north-eastern corner of the Principal Site, removing two fields completely from the Scheme, to avoid impacts upon the scheduled monument Harpswell Hall, and removal of solar panels from two fields west of the scheduled monument.
  - f. Removal of solar infrastructure from north of Kexby Road and west of Northlands Road to mitigate heritage impacts relating to the setting and views from Glentworth Hall and the non-designated historic farmstead Glentworth Grange.
- 6.4.10 These measures are secured in the DCO through **Works Plans [EN010142/APP/2.3]**, the **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]** and the **Framework Construction and Environmental Management Plan [EN010142/APP/7.8]**.
- 6.4.11 In addition, details for the avoidance/preservation areas will be set out in an Archaeological Mitigation Strategy that will be developed with the relevant local planning authorities following the submission of the DCO Application.

## Assessment of Effects

### Construction Effects

- 6.4.12 It is not anticipated that there will be any significant impacts upon any built heritage assets as a result of temporary changes to their settings arising from the presence of construction works. In addition, there are not anticipated to be any significant effects on historic landscape character as a result of the presence of construction works. These effects have been assessed as **not significant**.
- 6.4.13 13 of the 31 historic important hedgerows within the Order limits would be subject to partial removals as a result the Scheme. Enhanced planting to fill any gaps and reinstatement of hedgerows along the Cable Route Corridor are proposed as part of the **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]**. As such, the effect on historic important hedgerows has been assessed as **not significant**.

6.4.14 During construction, the physical impacts of the Scheme on six non-designated archaeological assets (Undated enclosure [AEC024]<sup>11</sup>, Cropmark and Earthwork Features [AEC043], Winter Camp of the Viking Great Army at Torksey [MLI125067], Iron Age or Romano-British Enclosure Complex [AEC031; MNT15983] Cropmark Complex [MNT4983; AEC032 and AEC033] and Romano-British Settlement [AEC035]) have been assessed as significant before considering additional mitigation. However, potential direct impacts on buried archaeological remains during construction will be managed through a programme of additional mitigation which includes archaeological investigation and recording, and a protocol for dealing with unexpected archaeological discoveries during construction. All archaeological mitigation works will be undertaken by an appropriately experienced and competent Archaeological Contractor in accordance with a Written Scheme of Investigation that will have been agreed with the Archaeological Advisors to Lincolnshire County Council, Nottinghamshire County Council, and Bassetlaw District Council and approved in writing by the relevant Local Planning Authorities prior to commencement of construction. With the implementation of the programme of additional mitigation the effect is reduced to **not significant**. There are **no significant** effects to any other heritage assets.

### **Operational Effects**

6.4.15 The potential for the Scheme to impact heritage assets as a result of long-term change to their setting from security lighting, operational noise, operation traffic and glint and glare were assessed as **not significant**.

6.4.16 It is not expected that the operation of the Scheme will result in any further intrusive activities and as such no impact to the buried archaeological assets is anticipated during this phase.

### **Decommissioning Effects**

6.4.17 It is expected that the selected method of decommissioning would have due regard to potential environmental effects, as set out within the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**.

6.4.18 There is the potential for temporary setting impacts during the removal of the solar infrastructure. It is not anticipated these would be worse than those assessed for the construction of the Scheme and these would therefore be **not significant**.

6.4.19 Buried archaeological remains already removed during construction would not experience any further effects as a result of decommissioning.

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<sup>11</sup> The unique identification numbers of heritage assets can be cross-referenced to the gazetteers presented in **Appendix 8-3: Cultural Heritage Gazetteers** of this Environmental Statement [EN010142/APP/6.2].

## 6.5 Ecology and Nature Conservation

### Introduction

- 6.5.1 **Chapter 9: Ecology and Nature Conservation** of the Environmental Statement [EN010142/APP/6.1] presents the findings of an assessment of the likely significant effects of the Scheme on the ecology within the Order limits and surrounding area. The assessment considers effects on designated sites, habitats and protected species during construction, operation and decommissioning of the Scheme. It was undertaken and reported with reference to the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines for EIA in the UK and Ireland (Ref. 12).

### Baseline

- 6.5.2 A desk study was undertaken to identify sites designated for nature conservation and records of protected and/or notable habitats and species (ecology features) and invasive non-native species that are relevant to the Scheme. Greater Lincolnshire Nature Partnership and Nottinghamshire Biological and Geological Records Centre were contacted in July 2022 to obtain pre-existing ecological data (i.e., location and citations of Local Wildlife Sites, records of protected, notable habitats and species; and on scheduled invasive non-native species within 2 km of the Order limits). A review of available online data was also undertaken using a range of sources as well as collaborative data from three other solar projects that neighbour or overlap with the Order limits (i.e. Gate Burton Energy Park, Cottam Solar Project and West Burton Solar Project).
- 6.5.3 The requirement for detailed ecological field surveys was determined following a Preliminary Ecological Appraisal. Ecological field surveys were undertaken in 2022 and 2023 as detailed in **Table 9-2** of **Chapter 9: Ecology and Nature Conservation** of the Environmental Statement [EN010142/APP/6.1], which also describes the survey areas, methods, results, survey periods and relevant guidance. Ecological features considered in the Environmental Statement include species and habitats that are important at an international, national, and local level (i.e., how rare and important the species and habitats are). The findings of these detailed surveys are presented in **Appendices 9-2 to 9-11** of the Environmental Statement [EN010142/APP/6.2].
- 6.5.4 The desk study identified no sites internationally designated for their biodiversity importance within 10km of the Order limits (Special Areas of Conservation (SAC), Special Protection Areas (SPA) and Ramsar sites) nor any for which bats are a qualifying feature<sup>12</sup> within 30km of the Order limits. The closest site designated for biodiversity importance at a national level is the Ashton's Meadow Site of Special Scientific Interest (SSSI), located approximately 1.5km to the west of the Cable Route Corridor.
- 6.5.5 There are 13 non-statutory sites designated for biodiversity importance within 2km of the Order limits (Local Wildlife Sites). Three of these sites,

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<sup>12</sup> A qualifying feature is habitat listed in Annex 1 of the Habitats Directive or a species listed in Annex 2 of the Habitats Directive that is known to be present within the site and is therefore a primary reason for the designation.

Willingham to Fillingham Road Verges Local Wildlife Site, Cow Pasture Lane Drains Local Wildlife Site and Upton Grange Road Verges Local Wildlife Site, are within the Cable Route Corridor. Coates Wetland Local Wildlife Site and Cottam Wetlands Local Wildlife Site are located adjacent to the Cable Route Corridor.

- 6.5.6 A Phase 1 habitat survey was undertaken between June and September 2022; and in June and August to November 2023. This survey identified that the land within the Order limits is dominated by arable agriculture, but also includes grassland fields, established trees and hedgerows with small areas of woodland (called copses) and ponds. The surrounding habitat is mainly arable, with small pockets of mature woodland. The findings of this survey identified the requirement for the following surveys to be undertaken: aquatic macrophyte and macroinvertebrate, terrestrial invertebrates, great crested newts, reptiles, amphibians, birds (breeding and non-breeding), bats, badger, otter, water vole and mink. The results of these surveys are presented in **Appendices 9-2 to 9-11** of the Environmental Statement **[EN010142/APP/6.2]**.
- 6.5.7 More detailed botanical and hedgerow surveys have also been undertaken where required. An arboricultural survey was also carried out of the trees within the Order limits, to determine their value and root protection areas, and identify the need for avoidance or mitigation. The findings of the arboricultural survey are presented in **Appendix 12-7: Arboricultural Impact Assessment** of the Environmental Statement **[EN010142/APP/6.2]**.

## Mitigation and Monitoring

- 6.5.8 Embedded avoidance and mitigation measures are incorporated into the Scheme, in line with national and local planning policy. These measures are detailed within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**. As a first principle, the Scheme has sought to avoid important ecological features and where this has not been possible, then embedded mitigation measures have been added to form an integral, committed and deliverable part of the Scheme or otherwise comprise standard construction practices. Examples of embedded mitigation for ecological features during construction include:
- a. Applying buffers from habitat features:
    - i. all woodland – at least 15m,
    - ii. watercourses (where practicable) – at least 10m from the bank-top of the watercourse;
    - iii. standing water – at least 20m; and
    - iv. hedgerows – where practicable, at least 5m.
  - b. A security perimeter fence will be implemented early in the construction phase to secure the Order limits and prevent construction activity in proximity to retained habitats within the Order limits and habitats adjacent to the Order limits; and
  - c. Where lighting is required during construction, it will conform to best practice guidelines with respect to minimising light spill into habitats.

- 6.5.9 As part of the landscape design for the Scheme, new habitats will be provided to increase biodiversity compared to existing baseline. This will include converting areas of agricultural land around and beneath the solar PV panels into grassland, strengthening hedgerows by planting up any gaps, planting new areas of trees and enhancing habitats next to watercourses and the designation of natural re-generation areas. The creation and subsequent management of habitats is detailed within **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]**. These measures will benefit wildlife by increasing areas of habitat provision and improving connectivity between habitats within and across the Order limits.
- 6.5.10 The Scheme will also provide a range of habitat boxes, for bats and birds within existing woodland areas and retained trees to increase the availability of nesting and roosting features and enhance the value of these habitats for these species groups. A number of reptile and amphibian habitat piles and hibernacula will be provided in suitable areas, such as close to ponds or watercourses, using natural materials generated during site clearance site, such as logs, turf, and grass strimming.
- 6.5.11 Pre-construction surveys will be undertaken during the appropriate seasons prior to the construction of the Scheme. These will inform detailed design where needed, provide up to date status of protected species that require mitigation during site clearance, and inform any protected species licensing that may be required should species distribution change or detailed design result in licencing requirements for species.
- 6.5.12 An Ecological Clerk of Works will be appointed to manage the risks to biodiversity on construction sites for the Scheme, advising on protecting or valued biodiversity features and providing practical solutions.
- 6.5.13 A programme of monitoring will be established prior to operation to ensure that biodiversity measures are implemented according to the management plans with necessary remediation. The programme is provided in the **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]**.

## Assessment of Effects

### Construction Effects

- 6.5.14 Effects on ecological features from infrastructure projects can arise from direct and indirect impacts upon designated sites, habitats or species, and be of a temporary or permanent nature. Indirect effects can occur for example through pollution of air and water, and as a result of changes in lighting, noise or hydrology.
- 6.5.15 With the implementation of suitable embedded mitigation, the assessment of effects on important ecological features has concluded that the potential for ecological effects are as follows:
- Temporary loss of habitat associated with Willingham to Fillingham Road Verges Local Wildlife Site and Upton Grange Road Verges Local Wildlife Site – Parts of these Local Wildlife Sites are located within the footprint of the Cable Route Corridor. During construction, access will be

required across Willingham to Fillingham Road Verges Local Wildlife Site for the Cable Route Corridor. An area of 60m<sup>2</sup> of road verge would likely need to be removed to provide the temporary construction access. This amounts to approximately 0.4% of the overall Willingham to Fillingham Road Verges Local Wildlife Site area. In addition, a single temporary passing place is required during construction within the Upton Grange Road Verges Local Wildlife Site to meet road safety requirements, which amounts to an area of 115m<sup>2</sup> of road verge. This is the equivalent of 0.4% of the overall Upton Grange Road Verges Local Wildlife Site area. Given the minimal area affected and the temporary nature of the works proposed, it is assessed that the effect of the Scheme on the long-term viability of these two Local Wildlife Sites is **not significant**.

- b. Temporary degradation of habitats within Cow Pasture Lane Drains Local Wildlife Site – A new crossing point (if required) would be in the form of a bailey bridge to be erected over part of the Local Wildlife Site for a temporary period during construction. The temporary bailey bridge would cause localised shading, amounting to <1% of the overall length of the Local Wildlife Site which is considered **not significant**;
- c. Damage to veteran trees from temporary accesses - The proposed permanent access routes encroach within the buffer zones of five veteran trees. All access within buffer zones will be micro-sited to be positioned as far from tree stems as possible and will utilise ground protection to ensure that tree roots and soil structure will be robustly protected. The effect is considered **not significant**;
- d. Direct loss of hedgerows within the Order limits - Construction activities are predicted to result in the potential for the loss of sections of hedgerow (as shown in the **Hedgerow Removal Plan [EN010142/APP/2.9]**). However, the planting of over 10km of new hedgerow consisting of native species has been embedded within the Scheme design (see **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]**). It is assessed that the effect associated with the direct loss of hedgerows would be **not significant**;
- e. Permanent loss of arable farmland for breeding Skylark within the Principal Site - 152 territorial males have been identified to be present across the Principal Site. It is acknowledged that construction activities will result in the loss of arable farmland used by breeding Skylark, however sufficient areas of habitat creation, alongside extensive habitat enhancements, have been incorporated into the Scheme to offset the impact of the loss of arable farmland for breeding Skylark as well as provide extensive benefits for other ecological features and wider biodiversity. Considering the embedded mitigation, the effect of habitat loss is considered **not significant**; and
- f. Permanent loss of arable farmland for breeding Quail within the Principal Site - A single Quail territory has been identified in arable habitat within the Principal Site. It is considered that, in the short-term, there may be a temporary loss of habitat available to Quail in some areas of the Principal Site as newly planted habitats mature. The effect associated with this habitat loss is considered **not significant**.



6.5.16 **No residual significant** effects on important ecological features are anticipated to occur due to the construction of the Scheme, with the implementation of suitable mitigation measures.

### **Operational Effects**

6.5.17 With the implementation of suitable embedded mitigation, the assessment of effects on important ecological features has concluded that the operation of the Scheme is unlikely to result in significant effects on important species, habitats and designated sites. Further assessment has been undertaken of the potential for the displacement of foraging bats as a result of the presence of the solar PV panels. This concluded that with the embedded avoidance and mitigation measures and a Scheme design which sets back PV panel arrays from all important habitats used by foraging bats, i.e., hedgerows and woodlands, there will be **no significant effect** on the bat populations present.

6.5.18 The **Biodiversity Net Gain Report [EN010142/APP/7.14]** quantifies the overall effect of the Scheme upon the biodiversity value of the area within the Order limits by comparing the baseline habitat value with that of the Scheme. Calculations consider the level of proposed habitat loss, retention, enhancement and/or creation delivered by the Scheme and are measured using Natural England's statutory biodiversity metric.

6.5.19 The Scheme is committed to deliver biodiversity net gain, in accordance with the requirements of the **draft DCO [EN010142/APP/3.1]**. The **Biodiversity Net Gain Report [EN010142/APP/7.14]** demonstrates that based on the current plans, the Scheme is predicted to result in a net gain of 64.55% for area-based habitat units, 17.33% for hedgerow units, and 22.94% for watercourse units.

6.5.20 Overall, with the consideration of planting and habitat enhancement measures proposed by the Scheme, the operation of the Scheme will result in **significant beneficial effects** to broad-leaved woodland, running water, hedgerows and breeding birds, particularly farmland birds associated with hedgerows and field margins.

### **Decommissioning Effects**

6.5.21 The effects of decommissioning of the Scheme are likely to be similar to those for construction, but with recognition that many of the potential impacts associated with the creation of internal accesses will not be relevant during decommissioning. Habitats and protected or notable species are likely to be subject to temporary damage of habitats and disturbance to species during decommissioning activities. Therefore, appropriate measures will need to be put in place to minimise degradation of habitats and disturbance of species, appropriate to the legislative and policy requirements at the time of decommissioning, as set out within the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**. Effects on ecology during the decommissioning of the Scheme are therefore considered to be **not significant**.

## 6.6 Water Environment

### Introduction

- 6.6.1 **Chapter 10: Water Environment** of the Environmental Statement [EN010142/APP/6.1] presents the findings of an assessment of the likely significant effects of the Scheme on the water environment, which includes impacts on flood risk, surface water features (such as rivers, streams and ditches) and groundwater, as well as the Scheme's demand for water. The assessment considers the impacts during construction, operation and decommissioning of the Scheme.

### Baseline

- 6.6.2 For the purposes of this assessment, a general Study Area of 1km around the Order limits has been considered. However, as watercourses flow, water quality and flood risk impacts may occur downstream and therefore the assessment also considers potential impacts further along watercourses themselves. The River Trent is considered to be the furthest downstream receptor, beyond which impacts would not occur.
- 6.6.3 Baseline desk study and site survey have identified a number of surface and groundwater features of importance within the 1km Study Area. The Order limits are located within the Witham catchment of the Anglian River Basin Management Plan and within the Lower Trent Erewash catchment of the Humber River Basin Management Plan.
- 6.6.4 There are many small watercourses and drainage ditches on the Principal Site, which is currently used mainly for agriculture, with a mosaic of agricultural fields, and the village of Harpswell and Glentworth on the eastern boundary.
- 6.6.5 The topography of the Principal Site is relatively flat, with existing ground levels in the region of 20-25m Above Ordnance Datum (AOD) according to online Ordnance Survey (OS) mapping. The land levels decrease to the west towards the River Trent floodplain. Using data from the closest weather station (Scampton) for the period 1991-2020, it is estimated that the Study Area experiences approximately 619mm of rainfall per year, which is low in the UK context.
- 6.6.6 There are several aquifers<sup>13</sup> within the Study Area, including the Scunthorpe Mudstone Formation, Charmouth Mudstone Formation, Penarth Group, and Mercia Mudstone Group, as well as several bedrock and superficial secondary aquifers.
- 6.6.7 Two surface water abstractions licenced by the Environment Agency are located within the Study Area. There were no licenced groundwater abstractions or private (unlicenced) water supplies in the Study Area.

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<sup>13</sup> Aquifer is a body of permeable rock which main contain or transmit groundwater.

- 6.6.8 The Order limits are contained within a Nitrate Vulnerable Zone<sup>14</sup>. A large Drinking Water Safeguard Zone<sup>15</sup> is present within the Study Area to the north-east of the B1398. There are no Source Protection Zones<sup>16</sup> within the Order limits.
- 6.6.9 Watercourses located within the Principal Site include the River Eau, its tributary Yawthorpe Beck, a tributary of Fillingham Beck and a tributary of the River Till. Watercourses located within the Cable Route Corridor include; Fillingham Beck, the River Till, a tributary of the Till, a tributary of the Skellingthorpe Main Drain, Marton Drain, the River Trent and Seymour Drain. Features such as ponds and small reservoirs are also located in the Order limits.
- 6.6.10 There are six designated Local Wildlife Sites with an aquatic component within the Study Area for the Cable Route Corridor, which are of local importance. However, there are no other designated sites for nature conservation within the Study Area.
- 6.6.11 The majority of the Order limits are located within Flood Zone 1 (less than 1 in 1,000 annual probability of flooding), with small areas of Flood Zone 2 (between 1 in 100 and 1 in 1000 annual probability) and Flood Zone 3 (1 in 100 or greater annual probability of flooding). The majority of the Order limits lie in areas of very low risk (chance of flooding of less than 1 in 1,000 annual probability) from surface water flooding. There are small areas of low (chance of flooding between 1 in 1,000 annual probability and 1 in 100 annual probability), medium (chance of flooding of between 1 in 100 annual probability and 1 in 30 annual probability) and high (chance of flooding of greater than 1 in 30 annual probability) risk of surface water flooding associated with watercourses.

## Mitigation and Monitoring

- 6.6.12 The construction of the Scheme will take place in accordance with the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, which provides details of the measures that would be undertaken to mitigate the temporary effects of construction on the water environment. These measures focus on managing the risk of pollution to surface water and the groundwater environment. It also includes measures regarding the management of activities within floodplain areas (i.e. kept to a minimum and with temporary land take required for construction to be located out of the floodplain as far as reasonably practicable).
- 6.6.13 Example mitigation measures included within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]** include:

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<sup>14</sup> Nitrate Vulnerable Zones are areas designated as being at risk from agricultural nitrate pollution.

<sup>15</sup> Drinking Water Safeguard Zones are established around public water supplies where additional pollution control measures are needed.

<sup>16</sup> Source Protection Zones are defined around large and public potable groundwater abstraction sites.

- a. For the construction compound east of Willingham by Stow, it is proposed to locate all staff and buildings above 10.7m AOD;
  - b. During the construction phase, the Contractor will monitor weather forecasts on a monthly, weekly and daily basis, and plan works accordingly;
  - c. Temporary drainage system will be developed to prevent runoff contaminated with fine particulates from entering surface water drains without treatment;
  - d. Where practical, earthworks will be undertaken during the drier months of the year;
  - e. Where practical, topsoil/subsoil will be stored a minimum of 20m from watercourses on flat lying land;
  - f. Fuel and other potentially polluting chemicals will either be in self-bunded leak proof containers or stored in a secure impermeable and bunded area; and
  - g. Any plant, machinery or vehicles will be inspected before every use and maintained to ensure they are in good working order and clean for use.
- 6.6.14 The final Construction Environmental Management Plan will be supported by a Water Management Plan that will provide greater detail regarding the mitigation to be implemented to protect the water environment from adverse effects during construction and include details of pre, during and post-construction water quality monitoring.
- 6.6.15 Watercourse crossings would utilise both intrusive (open-trench) and non-intrusive (trenchless) techniques. For non-intrusive crossings, the send and receive pit excavations will be located at least 10m from the watercourse and typically would be a minimum of 3m below the bed of the watercourse. For the River Trent and River Till crossings, the minimum depth of the crossing would be 5m. For intrusive crossings, a pre-works survey of the channel would be undertaken to enable reinstatement following completion of the crossing works. Enhancement works will also be undertaken between 5 and 10m upstream and downstream of each intrusive crossing.
- 6.6.16 An Emergency Response Plan would also be prepared in advance of construction providing details of the response to be taken to a flood event, should one occur during construction.
- 6.6.17 The Principal Site will operate using good practice and comply with environmental legislation through the application of a **Framework Operational Environmental Management Plan [EN010142/APP/7.9]**, including correct storage and use of any chemicals involved in the maintenance and running of the site. The **Framework Operational Environmental Management Plan [EN010142/APP/7.9]** also provides details of appropriate maintenance for Sustainable Drainage Systems (SuDS) and other drainage infrastructure.
- 6.6.18 The solar PV panels will be offset from watercourses by 10m from the edge of wetted channel, or 9m from the top of the bank of watercourse.
- 6.6.19 There is a small area of Flood Zone 3 within the Principal Site where solar PV panels are proposed. Within this area, the base of solar PV panels will be

higher than the predicted flood water levels when taking into account climate change, to provide sufficient contingency during flood events. In all other areas of the Principal Site, the base of the solar PV panels will be no less than 0.6m above ground level.

- 6.6.20 An Outline Drainage Strategy has been prepared and is included as **Appendix 10-4** of the Environmental Statement [EN010142/APP/6.2]. The strategy considers additional run off that may be generated by the Scheme and includes attenuation of this runoff and minimisation of flood risk to surrounding areas through the provision of swales.. Foul drainage from the Solar Farm Control Centre would utilise a cess pit, with no pathway to ground or surface water, which will be regularly emptied and tankered offsite for treatment and disposal.
- 6.6.21 The **Framework Operational Environmental Management Plan [EN010142/APP/7.9]** includes measures to manage the risk of pollution from small leaks and spillages from proposed infrastructure and maintenance activities as well the requirement for regular inspection and maintenance of the drainage systems. It also identifies that it is assumed that the solar PV panels will be cleaned around once per year, using clean water tankered in from offsite, with no added chemicals.
- 6.6.22 Potential impacts from the decommissioning phase of the Scheme are similar in nature to those during construction, as some ground works would be required to remove infrastructure. A **Framework Decommissioning Environmental Management Plan [EN/010142/APP/7.10]** is included with the DCO Application and provides details of prevent pollution and flooding measures required during the decommissioning phase.

## Assessment of Effects

### Construction Effects

- 6.6.23 Construction works would be carried out in accordance with the mitigation measures described above and documented within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, so that impacts on local watercourses are appropriately managed and, to the extent practicable, prevented. Following the implementation of these measures, effects of construction works causing pollution to surface water features were assessed as **not significant**.
- 6.6.24 Similar to that for surface water features, groundwater would be protected through the mitigation measures described above and documented within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**. Following the implementation of these measures, effects of construction works on groundwater quantity, quality, and flow were assessed as **not significant**.
- 6.6.25 During construction, the flood risk resulting from the construction works will not contribute to existing flood risk within or surrounding the Order limits due to the drainage in place. Effects from construction works on flood risk were assessed as **not significant**.

## Operational Effects

- 6.6.26 As the Cable Route Corridor will be installed below ground with no permanent above ground structures required, there is no potential for the Cable Route Corridor to impact the water environment once construction is complete.
- 6.6.27 During the operational phase, there is the potential for adverse impacts on surface water features and groundwater from run-off and spillages from new hardstanding and maintenance activities, if not properly mitigated. There is the potential for impacts on hydrology to occur from alterations to natural flow pathways, and an increase in diffuse pollutants received by waterbodies. However, the Scheme would apply the mitigation measures described above and included within the **Framework Operational Environmental Management Plan [EN010142/APP/7.9]**.
- 6.6.28 The Outline Drainage Strategy (**Appendix 10-4** of the Environmental Statement [**EN010142/APP/6.2**]) includes requirements and designs to contain fire suppression water, should an internal fire occur at a BESS. This water will be contained until such time as it can be tested and disposed of using a suitable Waste Contractor.
- 6.6.29 The Scheme may also require new surface water outfalls within unnamed ditches and Yawthorpe Beck, and possibly the River Eau for operational drainage. Watercourse crossings for access within the Principal Site would cross Yawthorpe Beck and unnamed ditches. These outfalls and watercourse crossings will result in small scale changes to the respective watercourse channels and their composition.
- 6.6.30 Following the application of the above embedded mitigation, effects on surface water features during the operation of the Scheme were assessed as **not significant**.
- 6.6.31 Following the application of embedded mitigation, the effects of the operation of the Scheme on groundwater quantity, quality and flow were also assessed as **not significant**.
- 6.6.32 During the operation of the Scheme, the drainage design will aim to replicate the natural drainage regime of the Principal Site, designing for the effects of climate change, and is, therefore, not envisaged to increase existing risk levels of flooding within or surrounding the Order limits. Effects on flood risk were assessed as **not significant**.

## Decommissioning Effects

- 6.6.33 The potential impacts on the water environment during decommissioning of the Scheme will be similar to those during construction. Mitigation measures have been included in the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]** to prevent pollution and flooding during this phase. Following the implementation of these measures, effects on the water environment during decommissioning are therefore anticipated to be **not significant**.

## 6.7 Human Health

### Introduction

- 6.7.1 **Chapter 11: Human Health** of the Environmental Statement [EN010142/APP/6.1] reports the findings of an assessment of the likely significant effects on human health and wellbeing as a result of the Scheme during construction, operation and decommissioning.

### Baseline

- 6.7.2 The Study Areas for the assessment of potential human health effects have been defined to include human populations likely to be at risk from the possible direct and indirect health impacts that might arise from the Scheme.
- 6.7.3 Data from the 2021 Census (Ref. 13) shows that the total population of the local ward Study Area, comprising West Lindsey district and Bassetlaw district, is 15,145. The population in Hemswell is 2,625; in Lea is 2,116; in Scampton is 2,806; in Stow is 2,445; in Torksey is 2,858; and, in Rampton is 2,295.
- 6.7.4 The 2021 Census provides the most recent data available showing residents' self-assessment of health with individuals identifying their overall health ranging from 'Very Good' to 'Very Bad'. At the time of the 2021 Census 5.2% of residents in the ward-level Study Area believed that they were living in 'bad' or 'very bad' health. This rate is lower than the proportions in West Lindsey (5.6%), Bassetlaw (6.6%), across the East Midlands (5.6%), and the same as the rate for England as a whole (5.2%). The proportion of residents in the local ward Study Area that experience limitations to their daily activities a little or a lot as a result of a health problem or disability is 21.1%. This is slightly higher than the proportion of residents in Bassetlaw (20.4%), West Lindsey (20.6%) the East Midlands (18.4%) and England as a whole (17.3%).
- 6.7.5 Across the local ward study area, life expectancy at birth for males is equal to or better (higher) than the national average for England (79.5 years). However, life expectancy at birth for males in Rampton ward is lower, at 77.5 years. Life expectancy at birth for females across the local ward Study Area is lower than the national average (83.2 years) in Lea ward and Stow ward (both 81.0 years) and Rampton ward (83.1 years). In all other local Study Area wards, life expectancy at birth for females is higher than the national average.
- 6.7.6 The nearest hospital (with an accident and emergency department) to the Principal Site is Lincoln County Hospital, which is approximately 16.5km to the south of the Order limits. The closest General Practices (GPs) to the Principal Site are Willingham-By-Stow Surgery, which is approximately 3.5km south-west of the Principal Site and the Ingham Practice, which is approximately 4km south-east of the Principal Site.
- 6.7.7 The closest primary school to the Principal Site Order limits is Hemswell Cliff Primary School (approximately 1.3km to the east of the Principal Site). Corringham Church of England voluntary controlled Primary School is also approximately 1.3km to the north-west of the Principal Site. The closest

secondary schools to the Principal Site are to the west in Gainsborough. The Gainsborough Academy is around 5.3km from the Principal Site and The Queen Elizabeth's High School is approximately 7km away.

## Mitigation and Monitoring

- 6.7.8 Embedded and additional mitigation measures are incorporated and secured into the Scheme as set out in the respective chapters in the Environmental Statement to reduce other construction, operational, and decommissioning effects (such as noise and vibration, air quality, and transport and access), which in turn will mitigate the effects on the local community and existing facilities from a Human Health perspective. These measures are detailed within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, **Framework Operational Environmental Management Plan [EN010142/APP/7.9]**, **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]** and **Framework Public Rights of Way Management Plan [EN010142/APP/7.16]**.
- 6.7.9 Permissive Paths to enhance the current PRoW network will be provided as part of the Scheme. Both routes are proposed within the Principal Site and are to be along Common Lane to the West of Glentworth. The first is a 1.5 km stretch, joining Northlands Road to the south-west of the Principal Site. The second is a 2 km stretch passing through to Kexby Road to the south.

## Assessment of Effects

### Construction Effects

- 6.7.10 The Applicant estimates that the Scheme will require an average of 812 gross fulltime equivalent workers during the construction period. Of these, approximately 122 are expected to be taken up by residents within the 60-minute drive time Study Area and approximately 690 are expected to be taken up by non-home-based workers. Assuming a worst-case, whereby all the approximately 690 construction workers who are not likely to live locally require places at local GPs, this would increase the average patients per GP provision across the two surgeries from 1,284 to 1,389 patients per GP, which would remain significantly better than the national target. The assessment of effects on healthcare infrastructure reflects impacts related to increasing demand on GP services. Therefore, it is concluded that these effects would be **not significant**.
- 6.7.11 The likely effects on human health arising from impacts on community connectivity, access to services and from impacts on prioritisation of walking and cycling during the construction phase (as detailed in Section 6.12: Transport and Access of this Non-Technical Summary) of the Scheme are assessed to be **not significant**. The likely effect on human health arising from impacts on road and route safety during the construction phase of the Scheme is assessed to be **not significant**.
- 6.7.12 The jobs arising from the construction phase of the Scheme would be temporary over the minimum 24 month construction period. The up to 138 additional jobs within the 60-minute drive time Study Area would represent local job growth, although the overall change would be small in the context of the overall number of jobs locally. The likely effect on human health arising



from impacts on employment and income during the construction phase of the Scheme is assessed to be **not significant** (beneficial).

6.7.13 Following the application of measures detailed within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, the likely effect on human health arising from impacts on air quality and noise and vibration during the construction phase of the Scheme are assessed to be **not significant**.

6.7.14 Effects on human health from the Scheme's contribution to climate change and impacts on landscape and visual amenity are assessed to be **not significant**.

### **Operational Effects**

6.7.15 Overall, due to the very low levels of traffic expected during the operation phase, and assuming a worst-case scenario whereby 12 employees from the Scheme move to the area and require places at local surgeries, the impact on access to healthcare services in the area would be **not significant**.

6.7.16 The likely effects on human health arising from impacts on community connectivity, access to services, prioritisation of walking and cycling, road and route safety during the operational phase (as detailed in Section 6.12: Transport and Access of this Non-Technical Summary) of the Scheme are assessed to be **not significant**.

6.7.17 The impacts of the Scheme on air quality during its operation are scoped out since the air quality effects arising from the traffic movements expected are anticipated to be minimal. Thus, air quality impacts on human health during the operation of the Scheme are assessed to be **not significant**.

6.7.18 Whilst some potential adverse noise and vibration effects have been identified during operation, no significant effects are predicted during operation. The likely effect on human health arising from impacts on noise during the operation of the Scheme is assessed to be **not significant**.

6.7.19 Effects on human health from the Scheme's contribution to climate change and impacts on landscape and visual amenity are assessed to be **not significant**.

### **Decommissioning Effects**

6.7.20 The effects on human health during the decommissioning of the Scheme are anticipated to be in line with or no worse than effects during the construction phase of the Scheme.

## **6.8 Landscape and Visual Amenity**

### **Introduction**

6.8.1 **Chapter 12: Landscape and Visual Amenity** of the Environmental Statement [EN010142/APP/6.1] presents the findings of an assessment of the likely significant effects of the Scheme on landscape and visual receptors.

6.8.2 In this assessment, 'landscape receptors' include consideration of published landscape character areas, which have informed the production of a site-

specific landscape assessment. Landscape effects relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities, and landscape character. This relates to both rural landscapes and urban landscapes.

- 6.8.3 'Visual receptors' relate to people and their existing views. Visual effects relate to the potential for changes to the composition of existing views, or from the addition or loss of elements within the view. Visual receptors include residents, recreational users of the PRow network, users of public open spaces, river traffic, roads and railways.
- 6.8.4 The assessment considers impacts during construction, operation and decommissioning of the Scheme and has been conducted in line with guidance in the Guidelines for Landscape and Visual Impact Assessment 3 (GLVIA3) (Ref. 14).

## Baseline

- 6.8.5 Site surveys and photography have taken place on several occasions between May 2022 and November 2023, which have allowed observations of the areas within the Order limits and the surroundings through different seasons and conditions.
- 6.8.6 The Principal Site is located on agricultural land. The land is generally flat and low-lying, but the Lincoln Cliff (or Edge) located to the east of the Order limits is a prominent local feature and contrasts with the low-lying farmlands. Expansive views are available from the crest (top of the scarp) of the Lincoln Cliff.
- 6.8.7 The Principal Site largely comprises fields that are medium to large scale and rectangular in shape. The fields are generally bounded by hedges, occasionally with trees but many are cut low and sometimes have sections missing. Hedgerows closer to the edges of villages and along some roads or tracks are often wider and taller, with more numerous trees. Woodland is relatively sparse.
- 6.8.8 Landscape receptors of the Scheme include National Character Area (NCA) 45: North Lincolnshire Edge with Coversands (Ref 11) and NCA 48: Trent and Belvoir Vale (Ref. 15). A number of regional (East Midlands Regional Landscape Character Assessment (Ref. 17)), county (West Lindsey Landscape Character Assessment, Bassetlaw Landscape Character Assessment (Ref. 18, Ref. 19)) and local (Trent Vale Landscape Partnership) landscape character areas were also identified as part of the baseline. These published assessments have been used to define five broad Local Landscape Character Types (LCT), which are then sub-divided into one or more Local Landscape Character Areas (LLCA), as follows:
- a. LLCA 1a within the Limestone Dip Slopes LCT;
  - b. LLCA 2a to 2e within the Lincoln Cliff Scarp and Spring-line Villages LCT;
  - c. LLCA 3a to 3c within the Till Vale LCT;
  - d. LLCA 4 within the Marton Ridge LCT; and
  - e. LLCA 5a to 5c within the Trent Valley LCT.

- 6.8.9 Further details of the LLCA can be found in **Table 12-4** of **Chapter 12: Landscape and Visual Amenity** of the Environmental Statement **[EN010142/APP/6.1]** and shown on **Figure 7** of this Non-Technical Summary.
- 6.8.10 For the visual assessment, 29 viewpoints were identified as being representative of visual effects as a result of the Principal Site. These viewpoints are summarised in **Table 12-5** of **Chapter 12: Landscape and Visual Amenity** of the Environmental Statement **[EN010142/APP/6.1]** and shown in **Figure 8** of this Non-Technical Summary. These include views from roads, locations near to residential locations and PRoW. Additional viewpoints were identified as being representative of visual effects as a result of the Cable Route Corridor. These viewpoints are summarised in **Table 12-6** of **Chapter 12: Landscape and Visual Amenity** of the Environmental Statement **[EN010142/APP/6.1]** and shown in **Figure 9** of this Non-Technical Summary and comprise views from roads, PRoW (including adjacent to the River Trent) and close to residential locations.

## Mitigation and Monitoring

- 6.8.11 The Scheme has been designed from the outset, and as far as practicable, to avoid adverse effects on the landscape and views. This has been undertaken through changes to the Order limits, siting of infrastructure components, provision of woodland for screening and new habitat areas; and minimising impacts on established vegetation and valued features that contribute to landscape character and visual amenity. The overarching landscape design principles are to:
- a. Provide buffers around residential properties, with woodland mitigation and areas of open grassland where appropriate;
  - b. Create an undeveloped gap between the Principal Site and the Cottam Solar Project;
  - c. Reinstate and/or improve field boundaries;
  - d. Use existing farm tracks and field openings as the preferred routes for construction access, minimising loss of hedgerows;
  - e. Site substations and the operational Solar Farm Control Centre in locations where existing screening will limit visibility;
  - f. Provide two permissive paths to increase connectivity across the Principal Site.
- 6.8.12 Details of the proposed planting and associated management measures are provided in the **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]** [and the Indicative Landscape Masterplan \[EN010142/APP/7.19\]](#).

## Assessment of Effects

### Construction Effects

- 6.8.13 The assessment has identified that **significant** landscape effects would arise as a result of construction of the Scheme on three LLCA namely, 2B Lincoln Cliff – Harpswell, 2C Lincoln Cliff – Open Farmland and 3A Till Vale –

Open Farmland. These effects are associated either with the widespread perception of the works or extensive change in landscape as a result of the Scheme. Effects on all other LLCA would be limited and **not significant**.

- 6.8.14 **No significant** landscape effects are expected for all LLCA in relation to construction of the Cable Route Corridor. The works will be of relatively limited extent and of a temporary, short-term duration, with very localised vegetation removal, plant and traffic movement, compounds and lighting.
- 6.8.15 During construction, it is anticipated that 13 representative viewpoints would experience **significant** effects. Eleven of these are associated with the Principal Site and two associated with the Cable Route Corridor. The effects for the Principal Site are predicted to be experienced at receptors in proximity to areas of the Principal Site identified for solar PV infrastructure as a result of short-range views with limited or no screening; or from receptors with open, elevated views from the Cliff. The effects for the Cable Route Corridor are associated with the proximity of PRow to construction activity.

### **Operational Effects**

- 6.8.16 Operational phase impacts have been assessed in both the first year of operation (Year 1) during winter (when there are no leaves on vegetation) and in Year 15 during summer, in accordance with industry landscape and visual guidelines (Ref. 14). At Year 1, it is assumed that there will be no growth from the new planting and no leaves on existing deciduous vegetation, so this stage represents the worst case, but not necessarily long-term, effects.
- 6.8.17 The assessment has identified that **significant** landscape effects would arise as a result of the presence of the Scheme at operation (Year 1) within LLCA, 2B Lincoln Cliff - Harpswell; and LLCA, 3A Till Vale – Open Farmland due to the perceptual influence of the Scheme in views.
- 6.8.18 Planting and ecological mitigation will provide localised screening and green infrastructure benefits from Year 15. However, a **significant** landscape effect on LLCA, 3A -Till Vale is considered to remain in relation to the Principal Site, due to the presence of solar infrastructure.
- 6.8.19 No significant landscape effects during the operational phase in relation to the Cable Route Corridor are anticipated, any effects would be **not significant**.
- 6.8.20 The 11 **significant** visual effects for representative viewpoints associated with the Principal Site identified during construction would remain during Year 1. However, mitigation planting will have matured by Year 15, by which point **significant** visual effects from three representative viewpoints will remain. The viewpoints are VP7 B1398 Middle Street, Glentworth Cliff, VP9 Kexby Road, west of Glentworth Grange: junction with bridleway Gltw/85/1, and VP13 Public footpath (Hems/787/82), Millfield, Hemswell. These viewpoints are associated with open, elevated views from the Cliff that are difficult to mitigate through screen planting.
- 6.8.21 In relation to the Cable Route Corridor, **no significant** effects are expected for Year 1 nor Year 15.

## Decommissioning Effects

- 6.8.22 Activities relating to decommissioning are likely to be similar to construction for the Principal Site as a worst-case scenario, including the temporary, short-term presence of plant and traffic movement and earthworks. The perception of change will be further reduced due to the increased maturity of vegetation of proposed planting and resultant screening. **No significant** landscape effects are expected to arise from the decommissioning phase.

## 6.9 Noise and Vibration

### Introduction

- 6.9.1 **Chapter 13: Noise and Vibration** of the Environmental Statement [EN010142/APP/6.1] presents the findings of an assessment of the likely significant effects of the Scheme on noise and vibration. The assessment considers the impacts during construction, operation and decommissioning of the Scheme.

### Baseline and Context

- 6.9.2 A baseline noise monitoring survey was completed around the Principal Site in July 2022. This monitoring indicated that road traffic noise was the dominant noise source at most locations. Where monitoring locations were not located close to roads, the dominant noise source was wind, bird song, farming activity or aircraft using Sturgate Airfield.

### Mitigation and Monitoring

- 6.9.3 Embedded mitigation includes the use of best practicable means identified in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]** and the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**, such as the sequential start-up of plant and vehicles rather than all together and regular plant maintenance.
- 6.9.4 Where practicable, horizontal directional drilling works will be avoided within 200m (the distance at which significant effects are predicted at night) of residential properties, and where drilling activities may occur within 200m of residential properties, the option for open cut cable laying will be explored as a quieter alternative to drilling. The potential for the use of quieter equipment than listed in the Environmental Statement will also be explored during procurement.
- 6.9.5 A construction noise monitoring scheme shall be developed alongside a communication strategy and noise complaint system. Voluntary consent under section 61 of the Control of Pollution Act 1974 (Ref. 20) will be sought prior to noisy work required outside core work hours being carried out to demonstrate that noise and vibration has been minimised as far as reasonably practicable. Monitoring during the decommissioning phase will be undertaken in accordance with the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**.

- 6.9.6 Consideration has been given to traffic routing, timing, and access points to the Scheme to minimise noise impacts at existing residential properties. Management of construction traffic on the highway network will be undertaken in accordance with the **Framework Construction Traffic Management Plan [EN010142/APP/7.11]**. A method of scheduling construction traffic from different work teams so they do not overlap is secured in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]** and the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**.
- 6.9.7 During operation, embedded mitigation includes plant selection and design layout to minimise noise at adjacent residential properties, with noise generating plant located at distance from residential properties, such that noise emissions are less impactful. For example, the Applicant has committed to Solar and BESS Stations being located more than 250m from residential properties at minimum, as part of the **Outline Design Principles Statement [EN010142/APP/7.4]**. In addition, to maintain flexibility in design layouts while ensuring certainty in the mitigation of noise, the Applicant has made a commitment within the **Framework Operational Environmental Management Plan [EN010142/APP/7.9]** that noise at adjacent residential properties will be no higher than the noise levels that are presented in the Environmental Statement.

## Assessment of Effects

### Construction Effects

- 6.9.8 Construction noise levels at surrounding residential properties will vary depending on the locations and types of works taking place. Due to the variation in work activities and locations across the Scheme, it is considered that any periods of regular construction noise levels experienced at a residential property would be of a limited duration due to the phased nature of construction (e.g., a few weeks or months, rather than the full duration of the construction period).
- 6.9.9 Construction noise will be controlled through mitigation measures documented within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, which include practical measures to reduce noise and vibration from construction works, such as switching off plant when not in use, regular maintenance of plant and undertaking noisy activity such as unloading in a considerate way to minimise noise generation. In addition, residents near to the Order limits would be kept updated of upcoming construction works, including when any particularly noisy activities would be undertaken. Following the application of these measures, all noise effects during construction were assessed as **not significant**.
- 6.9.10 Following the application of mitigation within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, the distance between residential properties and locations where high vibration generating construction activities will occur is such that construction induced vibration effects are **not significant**.

6.9.11 Noise impacts from construction traffic have been modelled and have identified the potential for significant effects to arise if each of the Cable Route Corridor construction teams cumulatively used the same routes in the absence of additional mitigation. However, appropriate measures have been included within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]** to ensure no overlap of construction team traffic. At residential properties adjacent to construction traffic routes, effects would therefore be **not significant**.

### **Operational Effects**

6.9.12 There is not anticipated to be any noticeable impulsive or intermittent characteristics from plant noise emissions experienced at the surrounding residential properties. Transformers within the BESS compound may have tonal features, although noise emissions from the BESS will be predominantly from cooling fans such that any tonal features of the transformers will not be noticeable. Overall plant noise emissions experienced at residential properties will therefore likely be perceived as a distinctive continuous and steady hum. Operational noise calculations have been completed and noise may be noticeable at some residential properties, based on the worst-case assumptions made in the assessment; however, these are at levels that would be **not significant**.

6.9.13 As the Cable Route Corridor will be installed below ground with no permanent above ground structures required, there is no potential for the Cable Route Corridor to generate operational noise or vibration. This is therefore **not significant**.

### **Decommissioning Effects**

6.9.14 It is assumed that the noise and vibration effects during decommissioning will be similar to the construction phase. Therefore, the standard mitigation measures included in the **Framework Decommissioning Environment Management Plan [EN010142/APP/7.10]** to mitigate noise and vibration impacts will be appropriate for the decommissioning phase and the effects are anticipated to be **not significant**.

6.9.15 Likewise, it is assumed that traffic numbers during decommissioning will be similar to the construction phase. Decommissioning is expected to be shorter in duration, less intensive, and with fewer road trips. Therefore, effects are considered to be no worse than during the construction phase and are anticipated to be **not significant** following the implementation of measures to ensure no overlap of decommissioning team traffic.

## **6.10 Socio-Economics and Land Use**

### **Introduction**

6.10.1 **Chapter 14: Socio-Economics and Land Use** of the Environmental Statement [EN010141/APP/6.1] presents the findings of an assessment of the likely significant effects on socio-economics and land use as a result of the Scheme. The assessment of effects on agricultural land and farming circumstances is provided in **Chapter 15: Soils and Agriculture** of the Environmental Statement [EN010141/APP/6.1] (see Section 6.11 of this Non-Technical Summary).

## Baseline

- 6.10.2 The Study Area for the Socio-economic and Land Use assessment is defined as a 60-minute travel area (drive time radius) in any direction from the Order limits.

### Population, Local Economy and Employment

- 6.10.3 The existing population, local economy and employment baseline is common to the Principal Site and the Cable Route Corridor since the Study Area covers the local district administrative areas of Bassetlaw and West Lindsey. Most of the Order limits fall within West Lindsey, with a small area of the Cable Route Corridor falling within Bassetlaw to the west.
- 6.10.4 According to 2021 Census data, the residential populations in West Lindsey and Bassetlaw have increased by 6.6% and 4.4% respectively since 2011. The residential populations in West Lindsey and Bassetlaw are expected to increase by a further 7.7% and 12.1% respectively by 2043.
- 6.10.5 In 2023, the unemployment rate for working-age residents was 1.3% in West Lindsey and 3.8% in Bassetlaw, compared to the average rates across the East Midlands (2.9%) and England (3.7%). The unemployed claimant count was 2.9% in West Lindsey and 3.1% in Bassetlaw, lower than the rates across the East Midlands (3.8%) and England (3.4%).
- 6.10.6 The most recent recorded Gross Value Added (a measure of economic productivity) per head data indicates a lower value in Lincolnshire (£18,959) and North Nottinghamshire (£18,816) compared to the averages across the East Midlands (£21,845) and England (£27,949).

### Local Accommodation

- 6.10.7 According to the 2021 census there are 93,803 households in West Lindsey and Bassetlaw, of which 15,921 are privately rented (accounting for 17.0% of the tenure mix). This compares to 64,873 owner occupied properties (69.2%) and 12,302 (13.1%) socially rented houses. According to the latest English Housing Survey, in 2022, approximately 3.3% of the dwellings in West Lindsey and Bassetlaw were vacant, which relates to a total of 3,106 dwellings.
- 6.10.8 As of 2023, there are approximately 12,399 rooms in local hotel, bed and breakfast and inns accommodation within a 60-minute drive of the Order limits.

### Local community severance

#### Principal Site

- 6.10.9 A number of communities lie close to the Principal Site. These include: Hemswell approximately 700m to the north; Harpswell adjacent to the north; Hemswell Cliff approximately 700m to the east; Glentworth adjacent to the east; Heapham approximately 700m to the west; and Springthorpe approximately 800m to the west.
- 6.10.10 There is one PRow located within the Principal Site connecting Willingham Road to Kexby Road, and one claimed bridleway (Claimed Glentworth and Harpswell Public Bridleway 1209) which runs through the eastern extent of



the Principal Site. There are also a number of further PRow within 500m of the Principal Site.

### **Cable Route Corridor**

6.10.11 The Cable Route Corridor comprises predominantly agricultural land. However, a number of communities lie within 1km. These include: Cottam (adjacent to the Cable Route Corridor); Rampton (adjacent to the west of the Cable Route Corridor); Stow (approximately 500m to the south); Marton (adjacent to the north); and Willingham by Stow (approximately 200m to the west).

6.10.12 There are 12 PRow and three claimed PRow that are within or run across the Cable Route Corridor, with a number of further PRow and claimed PRow within 500m of the Cable Route Corridor.

### **Agricultural Production**

6.10.13 The DEFRA “*Structure of the agricultural industry in England and the UK at June*” (Ref. 21) sets out that there are 1,176,757ha of agricultural land in the East Midlands. It identifies the total amount of agricultural land in Nottinghamshire is 137,401ha and Lincolnshire is 488,91ha.

6.10.14 The Principal Site comprises predominantly agricultural land with some small woodland areas. The total area of the Principal Site is approximately 1,350ha. Of this, 1,212ha is in agricultural use, with the remainder (138ha) being categorised as non-agricultural land.

### **Local Land Use and Amenity**

6.10.15 There are no residential properties, non-agricultural businesses, designated open space, community facilities or visitor attractions within the Order limits. Albeit there are residential properties that would be surrounded by the Order limits if development consent is granted.

6.10.16 There is one allocated development site, which is subject to a planning application, within the Principal Site. This is a proposal to construct a hydrocarbon wellsite on the land to the west of Northlands Road, Glentworth.

6.10.17 The Cable Route Corridor currently encompasses parts of proposed cable routes for other solar projects (Gate Burton Energy Park, Cottam Solar Project and West Burton Solar Project). In addition, the Cottam Power Station site is identified as being a Priority Regeneration Area within the emerging Bassetlaw Local Plan, however, the site is not currently allocated for any alternative uses. A planning application for two agricultural barns within the Cable Route Corridor Order limits near Marton has also been granted, albeit it is anticipated that a solution can be found for the barns to be constructed in a way and in a location such that it would not affect the Scheme and vice versa.

### **Mitigation and Monitoring**

6.10.18 Mitigation measures are embedded within the Scheme to reduce other construction and operational effects (relating to noise, air quality, transport and landscape), which in turn will mitigate the effects on the local community and existing facilities from a Socio-Economic and Land Use perspective. The

relevant mitigation measures are set out in the respective sections of this Non-Technical Summary.

6.10.19 Any temporary diversions, management and closure of PRow during the construction phase will be monitored to ensure that they are suitable and well-maintained for use. Each diversion will be clearly marked out, along with appropriate signage at either end of the diversion. The diversion routes will be agreed with the relevant local authority prior to the construction phase and the commencement of any works. Existing PRow will be reinstated once construction access is no longer required. These measures are set out within the **Framework Public Rights of Way Management Plan [EN010142/APP/7.16]**.

6.10.20 The **Framework Operational Environmental Management Plan [EN010142/APP/7.9]** and **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]** set out measures to reduce amenity impacts on sensitive receptors during the operational and decommissioning phases, respectively.

6.10.21 The **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]** also includes measures that will ensure the restoration of agricultural land and soils to its existing use, following decommissioning. Additionally, similar measures from the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]** will also be considered for the Decommissioning Environmental Management Plan, including temporary diversions of PRow to be put in place during the decommissioning phase.

6.10.22 A **Framework Skills, Supply Chain and Employment Plan [EN010142/APP/7.18]** has been prepared to maximise and pro-actively expand the economic benefits of the Scheme for the local community. These include commitments to the following:

- a. The Applicant will require contractors to provide opportunities for the creation of apprenticeships and training places during construction and decommissioning as part of its procurement process;
- b. The Applicant will investigate the potential for a programme of activities which promote science, technology, engineering, and mathematics (STEM) education and careers;
- c. The Applicant will investigate measures to promote take up of jobs generated by the Scheme by local people, including requiring contractors to promote local employment during construction and decommissioning; and
- d. The Applicant will work with local partners to communicate purchasing and contracting opportunities arising from the Scheme to local businesses.

## **Assessment of Effects**

### **Construction Effects**

6.10.23 The construction period is expected to take approximately 24 months, which includes the construction of the Principal Site and Cable Route Corridor. It is

estimated that the Scheme will require a peak of 1,420 full-time equivalent jobs, and an average of approximately 812 gross direct full time equivalent jobs on-site over the 24 month construction period. It is anticipated that 15% of construction staff could be sourced from a 60 minute drive from the Order limits. As such, 85% of staff would be likely to reside outside the Study Area.

- 6.10.24 Taking into account displacement (the extent to which the benefits of a development are offset by reductions in employment elsewhere) and multiplier (increase in local employment arising from indirect and induced effects of the construction activity) effects, the Scheme will support, on average, 914 net additional jobs during the construction period. Of these, 138 jobs per annum will be expected to be taken-up by residents within the 60-minute drive time Study Area, and 776 by people residing outside this Study Area. Whilst providing a **beneficial** effect at a regional scale, it is considered **not significant**.
- 6.10.25 Based on a worst-case scenario whereby all 690 workers need accommodation, the workforce would require 690 homes whereby approximately 527 are available. There are also a further 12,399 rooms in hotel, bed and breakfast and inns accommodation within a 60-minute drive time from the Scheme. At peak occupancy (during August, September and October), after accounting for the demand from workers outside of the Study Area, there is a minimum surplus of 2,689 rooms available. There is considered to be sufficient local supply to facilitate all construction workers being housed in accommodation. The influx of construction workers on local accommodation availability as a result of the Scheme is assessed to be **not significant**.
- 6.10.26 The impact of direct Gross Value Added generation from the construction phase on the economy within the West Lindsey and Bassetlaw was assessed as a temporary beneficial effect on both a local and regional scale. This is considered **not significant**.
- 6.10.27 Taking into account the results of the noise, traffic, visual and air quality assessments, there are no residents, businesses or community facilities that would likely experience a significant effect during construction in relation to more than one of these topics. Therefore, there are expected to be **no effect** on amenity arising from the Scheme for these local assets during construction.
- 6.10.28 No permanent closures to PRow are expected as a result of the Scheme. During the construction period, PRow will either be diverted locally, managed with a banksman (or similar) or as a worst-case, require temporary closure (in case of the PRow along Torksey Road). The overall effect of the Scheme on PRow and local community severance is assessed to be **not significant**.
- 6.10.29 The Principal Site represents a very small proportion of the land in Lincolnshire, East Midlands and England. The permanent effects on agricultural production arising during construction at the Principal Site would be **not significant**. As all agricultural land within the Cable Route Corridor would be returned for use after construction, any temporary impact on agricultural production from the use of this land will not be discernible and as such there would be no effect.

## Operational Effects

- 6.10.30 The Scheme will generate an estimated minimum 10 full time equivalent long-term jobs during the operational phase. Therefore, it has been assessed that there will be **no significant effect** with regard to operational employment associated with the Scheme.
- 6.10.31 Any PRow located within the Order limits that are required to be temporarily closed or diverted during construction will be re-opened during the operational phase. In addition, two new permissive pathways connecting Common Lane with Kexby Road and Northlands Road will be provided as part of the Scheme. These new permissive pathways have been assessed to result in a **not significant** effect.
- 6.10.32 Taking into account the result of the air quality, noise, traffic and visual assessments, there are no residents, businesses or community facilities that would likely experience more than one significant effect on their amenity during operation, as such no significant effect from impacts acting in combination has been identified. Predicted operational traffic levels are low and have been scoped out of assessment, as agreed by the Planning Inspectorate. There is therefore expected to be **no effect** on community connectivity. Overall, it is assessed that there would be **no effect** on private and community assets during the operational phase.

## Decommissioning Effects

- 6.10.33 At the end of its operational life, the Scheme will be shut down and the infrastructure will be removed. It can be expected that employment will be generated to carry out the removal of the infrastructure from the Order limits. It is assumed based on the activities taking place that a similar number of jobs required for constructing the Scheme will also be required for decommissioning.
- 6.10.34 Most PRow within the Order limits will be unaffected during the decommissioning phase and there may be temporary diversions but no permanent closures. The new permissive pathways will be in place for the lifetime of the Scheme and may be removed following decommissioning if requested by the landowner. All other PRow will revert back to the original PRow network following decommissioning. The effect of decommissioning on PRow and local community severance is therefore assessed to be **not significant**.
- 6.10.35 Taking into account the residual effect assessment results of the air quality, noise and vibration, traffic and transport and visual assessments relating to the decommissioning activities, there are no receptors that would experience a significant effect on their amenity during decommissioning activities, and as such, there would be **no effect** during this phase.

## 6.11 Soils and Agriculture

- 6.11.1 **Chapter 15: Soils and Agriculture** of the Environmental Statement **[EN010141/APP/6.1]** reports the findings of an assessment of the likely significant effects on soils and agricultural land as a result of the Scheme.
- 6.11.2 The majority of the land within the Principal Site is agricultural, however approximately 10% of the land with the Principal Site currently comprises

hedges, trees and other features and is not considered agricultural land for the purposes of the assessment.

- 6.11.3 Agricultural Land Classification (ALC) is the standard method for classifying agricultural land in England and Wales based on the type and level of agricultural production it can potentially support. The best quality agricultural land (Grades 1, 2 and Subgrade 3a) is known as Best and Most Versatile (BMV) and is given a greater level of protection in planning policy than lower quality, non-BMV, land (Subgrade 3b and Grades 4 and 5).
- 6.11.4 The soil and ALC survey identified that approximately 85.3% of land within the Principal Site is of non-BMV quality (Subgrade 3b) with 4.5% of the land considered BMV quality (Grade 2 and 3a).
- 6.11.5 The soil resource within the Principal Site is predominantly heavy textured (high clay content) topsoil and subsoil. The majority of land within all of the Principal Site is under conventional arable management with ploughing each year for crop residue incorporation, weed control and preparation of a seed bed.
- 6.11.6 There has not been an ALC or soil resource survey for the Cable Route Corridor; this is not required to understand the impacts from the Scheme given there is no permanent loss of agricultural land along the cable route and this approach is consistent with neighbouring solar farm developments promoted through the DCO process.
- 6.11.7 Several separate farm businesses occupy land within the Principal Site. Interviews have been conducted with occupants for five owner occupied units. Land is predominantly in standard arable rotations of cereals and break crops, with some energy crops grown for use in Anaerobic Digestion and bio-ethanol production.

## Mitigation and Monitoring

- 6.11.8 Embedded mitigation measures include the use of standard industry good practice measures as identified in the **Framework Soil Management Plan [EN010142/APP/7.12]** and **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]**. The **Framework Soil Management Plan [EN010142/APP/7.12]** provides guidance for the construction, operational and decommissioning phases of the Scheme, identifying measures for the preservation of the soil resource within the Order limits.
- 6.11.9 Additionally, the Scheme has been designed, as far as practicable, to avoid and minimise impacts to BMV land through the site selection process and refinements to the Order limits.

## Assessment of Effects

### Construction Effects

- 6.11.10 Construction work will temporarily cease arable production within the Principal Site which would be reinstated, should the land owner wish, on completion of the decommissioning works. The land occupied by Principal Site components added as part of the Scheme, comprising BESS, Solar

Farm Control Centre and storage, on-site substations, access track, permissive path and woodland cannot continue in agricultural use for the duration of the operational phase. The remaining arable land would be planted with species-rich grassland that could be managed by grazing, as set out within the **Framework Landscape and Ecological Management Plan [EN010142/APP/7.17]**. It can however, all be restored to agricultural use by the landowner at decommissioning.

- 6.11.11 The long-term reversible loss of agricultural land within the Principal Site through conversion to non-agricultural grassland or creation of hard standing was assessed as **not significant**.
- 6.11.12 The construction phase will involve trafficking the land in a similar manner to the current arable land use. Following the implementation of mitigation measures identified within the **Framework Soil Management Plan [EN010142/APP/7.12]**, the effects on soil resources during construction of the Scheme were assessed as **not significant**.
- 6.11.13 The start of construction work will mark the beginning of the temporary curtailment of arable management within the Principal Site. While construction work is taking place the land will not be available for grazing livestock or equestrian use either. The effect on farming circumstances is considered **not significant**.

### **Operational Effects**

- 6.11.14 During the operational phase of the Scheme, there will be no loss of agricultural land quality.
- 6.11.15 While the Scheme is operational, the soil resource at the Principal Site will remain under a perennial grass cover facilitating a recovery in topsoil organic matter. The effects of the operation of the Scheme on soil resources are assessed as **beneficial (significant)**.
- 6.11.16 During operation, grass below and between the solar panels will need to be managed. This management can include grazing by livestock where appropriate. Landowning farm businesses will receive income from the Scheme's occupation of their land, a new diversified enterprise. The effects of the operation of the Scheme on farming circumstances are assessed as **beneficial (significant)**.

### **Decommissioning Effects**

- 6.11.17 Decommissioning work will allow the land to be managed for arable production again after an extended fallow period of low input grassland. All infrastructure within the Principal Site will be removed up to a depth of 1m. With no loss of agricultural land quality, there would be **no effect**.
- 6.11.18 As for construction, decommissioning will involve trafficking the land in a similar manner to the current arable land use. Following the implementation of mitigation measures identified within the **Framework Soil Management Plan [EN010142/APP/7.12]**, the effects on soil resources during decommissioning of the Scheme were assessed as **not significant**.
- 6.11.19 Decommissioning of the Scheme will allow a return to current agricultural management options for the land within the Principal Site. As is currently the case, the actual management of the land (arable, pasture, horticulture,

woodland etc.) will be a decision for farm managers based upon the prevailing market conditions, opportunities, support payments and regulatory environment. There is no obligation for land to return to arable production just as at present there is no obligation to maintain arable production. The effects of the decommissioning of the Scheme on farming circumstances are assessed as **not significant**.

## 6.12 Transport and Access

### Introduction

6.12.1 **Chapter 16: Transport and Access** of the Environmental Statement [EN010141/APP/6.1] reports the findings of an assessment of the likely significant effects on traffic and transport as a result of the Scheme during construction and decommissioning. Due to the low level of trips likely to be generated within the network peak hours, an assessment of the operational phase was excluded from the Environmental Statement.

### Baseline and Context

- 6.12.2 The A631 is a single-carriageway road which links with the A15 in the east, providing a key route to Lincoln and connections to the M180 and A46, and the A638 past Gainsborough in the west. To the west of the Order limits the A631 provides a connection to the A159 and the A156 which are both routes through Gainsborough to the north and south respectively.
- 6.12.3 The A57 is a single carriageway road which links the A1(M) to the A46 to the west of Lincoln. The A57 is classified by the Department for Transport as part of the Strategic Road Network and provides access to the A15 from the south. The A57 also provides access to Laneham Road, which joins with Rampton Road and provides access to Cottam Road from the west.
- 6.12.4 There are several A-roads and B-roads in the vicinity of the Principal Site such as the A631, A1500, B1241 and B1398. There are also other local roads including Common Lane, High Street/ Willingham Road, Kexby Lane, Fillingham Lane and Spingthorpe Road/ Hill Road.
- 6.12.5 There are several A-roads and B-roads in the vicinity of the Cable Route Corridor such as the A156, A1500 and B1241. There are also other local roads including Town Street/ Headstead Bank, Cottam Road/ Outgang Lane, Torksey Ferry Road, Rampton Road, Green Labe and Laneham Road. In order to provide access, the Cable Route Corridor includes Cow Lane (to the east of Upton), Fillingham Lane (to the east of Willingham by Stow), South Lane (to the east of Willingham by Stow) and Stow Park Road (off the A1500) (to the south of Cottam Power Station).
- 6.12.6 There is one PRow and one claimed PRow located within the Principal Site and 12 PRow and three claimed PRow which could be impacted by the works within the Cable Route Corridor. These PRow also provide equestrian facilities. Laughton Wood Equestrian Centre is also located approximately 11 km from the Principal Site to the north of Gainsborough.
- 6.12.7 There are no on- or off-road dedicated/ marked cycling facilities within the immediate vicinity of the Order limits. The nearest National Cycle Network

route (between Harby and Lincoln) is located approximately 25km to the south of the Principal Site.

6.12.8 Bus services 100, 103, 106 and 354 serve the Principal Site and are in close proximity to the Cable Route Corridor within Lincolnshire. Bus stops are located on the A631, B1398 (Middle Street) and B1241 (Willingham Road) which are in close proximity to the Order limits. In addition, bus service 190 (with bus stops on Cottam Lane) serve the western extent of the Cable Route Corridor within Nottinghamshire.

6.12.9 Gainsborough is located to the west of the Principal Site and has two railway stations, Gainsborough Central and Gainsborough Lea Road (approximately 10km from the Principal Site). Retford Station and Saxilby Station are located to the west and south of the Cable Route Corridor (approximately 10km from the Cable Route Corridor).

## Mitigation and Monitoring

6.12.10 Embedded mitigation measures have been included in the Scheme through the provision of a **Framework Construction Traffic Management Plan [EN010142/APP/7.11]**. The mitigation to minimise construction impacts included in the **Framework Construction Traffic Management Plan [EN010142/APP/7.11]** includes (but is not limited to):

- a. Suitable access points have been identified to enable movement of vehicles into sites where appropriate. Supporting improvements (e.g. local carriageway widening and vegetation clearance) have been included within the Scheme where required;
- b. Utilising the existing access arrangements for Cottam Power Station to access the National Grid Cottam Substation via Torksey Ferry Road;
- c. Providing a haul road to facilitate the construction of the Cable Route Corridor;
- d. Delivering an internal shuttle service, which utilises internal routes through the Principal Site, to allow construction staff to access all areas from the four Principal Site accesses;
- e. Implementing an external shuttle service to transfer staff to/ from nearby catchment areas to reduce vehicle trips on the surrounding highway network.
- f. Providing sufficient, but capped, on-site car parking within the Principal Site compounds to accommodate the expected peak parking demand of construction staff within the Principal Site;
- g. Encouraging construction staff to car share to reduce single occupancy car trips, by promoting the benefits of car sharing such as reduced fuel costs and by providing dedicated parking spaces for those car sharing within the compounds. A Car Share Scheme will be implemented;
- h. Providing 12 cycle parking spaces within the Principal Site to encourage construction staff to travel by bicycle where viable;
- i. Restricting HGV, and LGV movements and abnormal loads to certain routes;



- j. Restricting HGV and LGV movements throughout the day to an eight-hour window between 08:30-16:30;
- k. Implementing a Delivery Management System to control the bookings of HGV and LGV deliveries from the start of the construction period;
- l. Implementing a monitoring system to record HGVs and LGVs travelling to and from the Scheme, to record any non-compliance with the agreed routing plan/ delivery hours;
- m. Carrying out road condition surveys pre-construction, during construction and post-construction, to identify any defects on highway assets/ verges that have arisen during the construction phase of the Scheme for re-instatement;
- n. Implementing temporary traffic management measures for partial or full road closures, where required, including for the construction of new access points, improvements to existing accesses, highway improvements such as passing bays and installation of the cable where it crosses existing roads;
- o. Positioning of suitably qualified banksmen at the proposed accesses for the Principal Site and Cable Route Corridor, to allow all vehicle arrivals and departures to be safely controlled during the construction period;
- p. Providing sufficient protection/ separation between existing PRoW and construction routes;
- q. A specialised haulage service is anticipated to be employed to allow abnormal indivisible loads to transport components with the necessary escort, permits and traffic management, with the contractor consulting with the relevant highway authorities to ensure the correct permits are obtained. The police will also be given advanced notification under the Road Vehicle Authorisation of Special Types Order 2003;
- r. Implementing local off-site highway improvements to accommodate abnormal indivisible loads travelling to the Principal Site and Cable Route Corridor, if required; and
- s. Two new permissive paths, which will benefit all vulnerable road users, are to be provided within the Principal Site during the operational phase of the Scheme.

#### 6.12.11 The **Framework Operational Environmental Management Plan**

**[EN010142/APP/7.10]** outlines measures to minimise impacts that may arise during the operation of the Scheme. These include:

- a. Providing suitable access points for operational vehicles;
- b. Converting the internal construction routes to maintenance routes, to allow operational vehicles to access all areas of the Principal Site via the proposed access points during the operational phase;
- c. Maintaining access to all existing PRoW within the Scheme, with no diversions or closures; and
- d. Controlling areas where the internal maintenance route crosses any existing PRoW or local access roads. Operational traffic should give-way to other users (pedestrians and road users) when utilising the crossing points.

6.12.12 In addition, the **Framework Decommissioning Environmental Management Plan (DEMP) [EN010142/APP/7.10]** summarises measures similar to the construction phase for decommissioning works.

## **Assessment of Effects**

### **Construction Effects**

- 6.12.13 The change in traffic flows with peak construction traffic from the Scheme added, as set out within Section 3.6 of this Non-Technical Summary, was modelled across the local highway network. The impact of traffic management for temporary and full road closures, and the subsequent change due to the provision of new accesses, on driver and passenger delay and severance was also considered in the assessment.
- 6.12.14 The assessment concluded that following the implementation of embedded mitigation, a **significant** effect would arise on severance/ pedestrian delay/ non-motorised user amenity on the B1241. This effect would only occur for a short period if activity on the construction of the Cable Route Corridor is concentrated in that particular area with works being carried out at multiple Cable Route Corridor sites accessed via the B1241.
- 6.12.15 All other highway links assessed were determined to have a **not significant** effect in terms of non-motorised user amenity, severance, driver and passenger delay, accidents and safety and fear & intimidation.
- 6.12.16 As both the partial and full temporary road closures will be for very short periods within the construction phase and in all circumstances alternative routes will be provided, the effects on driver and passenger delay and severance were considered to be **not significant**.
- 6.12.17 The effects on all PRow were also determined to be **not significant**, considering the management measures set out within the **Framework Public Rights of Way Management Plan [EN010142/APP/7.16]**.

### **Operational Effects**

- 6.12.18 During the operational phase, routine activity on-site will be minimal and will be restricted principally to vegetation management, equipment maintenance and servicing, replacement of any components that fail, and monitoring to ensure the continued effective operation of the Scheme. As such, an operational phase traffic assessment was scoped out from further consideration.

### **Decommissioning Effects**

- 6.12.19 The estimated duration of the decommissioning period is expected to be less than or similar to that of the construction period and the number of construction vehicles required is assumed to be the same as for construction. The decommissioning effects are therefore assessed to be the same as, or not greater than, those for construction phase, on both highway links and PRow.

## 6.13 Other Environmental Topics

### Introduction

6.13.1 **Chapter 17: Other Environmental Topics** of the Environmental Statement [EN010142/APP/6.1] presents the findings of the assessments of the Schemes on the following topics which are covered in the sections below:

- a. Glint and Glare;
- b. Ground Conditions;
- c. Major Accidents and Disasters;
- d. Telecommunications, Television Reception and Utilities;
- e. Materials and Waste; and
- f. Electric and Electro-Magnetic Fields.

### Glint and Glare

6.13.2 This section provides a description of the potential glint and glare effects of the Scheme.

6.13.3 A glint and glare assessment was completed to understand the potential for solar panels to cause either momentary flashes of bright light (referred to as 'glint') or a continuous source of bright light (referred to as 'glare'). The design of the Scheme includes embedded design mitigation for glint and glare, including landscaping to screen the Scheme from view of receptors to glint and glare.

6.13.4 A 1km Study Area around the extent of the Principal Site was considered for the assessment of ground-based (residential, road, rail and PRow) receptors, whilst a 30km Study Area was defined for aviation receptors.

6.13.5 85 residential receptors and 160 road receptors were identified within 1km of the Principal Site and taken forward for further assessment. Of the 14 aerodromes within the 30km study area only Sturgate Airfield, Royal Air Force Scampton and Wickenby Airfield (eight runways in total) were taken forward for further assessment.

6.13.6 The assessment concluded:

- a. Solar reflections are not possible at any of the 85 residential receptors within the 1km Study Area;
- b. Solar reflections are not possible any of the 160 road receptor locations assessed within the 1km Study Area;
- c. Only Green Glare (Low-Potential for after-image) impacts were predicted for Runway 27 at Sturgate Airfield, which is an acceptable impact on runways according to US Federal Aviation Administration guidance.

6.13.7 The effects are considered to be negligible/none, except for overall aviation impacts which are low and **not significant**.

6.13.8 No additional mitigation is required as no impacts were identified for the residential and road receptors and only a low impact identified for aviation receptors.

## Ground Conditions

6.13.9 This section provides a description of the potential effects of the Scheme on ground conditions.

6.13.10 A Preliminary Risk Assessment, **Appendices 17-3 and 17-4** of this Environmental Statement [EN010142/APP/6.2], was completed to review current and past land uses within and surrounding the Order limits to consider whether there is potential for soil contamination to be present.

6.13.11 The Preliminary Risk Assessment considered potential contaminant pathways. All risks were assessed to be **not significant**.

6.13.12 Intrusive site investigation is proposed by the Applicant at the post-consent stage to provide geo-environmental data to evaluate soil and groundwater quality and verify the conceptual site model. It will also verify the proposed mitigation measures so that unacceptable pollutant linkages do not exist on completion of the Scheme.

6.13.13 Several embedded environmental design and management measures will be employed as standard best practice to minimise impacts to both human health and controlled waters during the construction, operation and decommissioning phases of the Scheme. These are described in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, **Framework Operational Environmental Management Plan [EN010142/APP/7.9]** and **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**.

## Major Accidents and Disasters

6.13.14 This section provides a description of the potential effects of the Scheme on the environment deriving from the vulnerability of the Scheme to risks of major accidents and/or disasters and the potential of the Scheme to result in major accidents.

6.13.15 “Accidents” are an occurrence resulting from uncontrolled developments in the course of construction, operation and decommissioning (e.g. a major emission, fire or explosion). “Disasters” are naturally occurring extreme weather events or ground related hazard events (e.g. subsidence, landslide, earthquake).

6.13.16 An exercise was undertaken to identify all possible major accidents or disasters that could be relevant to the Scheme, including floods, fire, road accidents, utilities failure using national and local resources.

6.13.17 Minimising the risk of major accidents during construction, operation and decommissioning will be addressed through appropriate risk assessments and measures as required in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, **Framework Operational Environmental Management Plan [EN010142/APP/7.9]** and **Framework**

### **Decommissioning Environmental Management Plan**

**[EN010142/APP/7.10]**. Mitigation for fire risk with regards to the design of the BESS are secured through the **Framework Battery Safety Management Plan [EN010142/APP/7.13]** and **Work Plans [EN010106/APP/2.3]**.

6.13.18 Given the nature of major accidents and disasters, there is the potential for significant effects if an event does occur during the construction, operation and decommissioning of the Scheme. However, the assessment concluded that the risk of such events occurring is low for the Scheme and significant effects on the environment are therefore not anticipated. The focus of the assessment is on prevention of major accidents and disasters, and identification of suitable mitigation if an event does occur. Taking into account the good industry practice and additional mitigation measures discussed above, the risk of major accidents and disasters is considered to be **not significant**.

### **Telecommunications, Television Reception and Utilities**

6.13.19 This section provides a description of the potential effects of the Scheme on telecommunication infrastructure, television reception and existing utilities.

6.13.20 The Scheme is unlikely to interfere with telecommunications and television transmission infrastructure as typically structures need to be more than 5 m in height to interfere with these signals. No effects on telecommunications and television reception are anticipated in the construction, operation and decommissioning phases of the Scheme.

6.13.21 The potential exists for utilities to be affected during the construction and decommissioning of the Scheme through inadvertent damage caused as a result of excavation and engineering operations. Without any precautionary measures to avoid damage to utilities, this could lead to short-term adverse effects.

6.13.22 The following embedded mitigation, set out within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, and **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**, has been included within the Scheme to prevent such damage from occurring:

- a. Locating the Scheme infrastructure outside of utilities protected zones;
- b. The use of ground penetrating radar before excavation to identify any unknown utilities; and
- c. Consultation and agreement with relevant utility operators regarding construction/demobilisation methods prior to works commencing.

6.13.23 Following the implementation of the measures detailed above **no effects** are expected during construction and decommissioning.

6.13.24 **No effects** on utilities are predicted as a result of the operational phase of the Scheme because no below-ground works will be required during operation.

## Materials and Waste

- 6.13.25 This section discusses the expected waste streams from the Scheme and how they will be managed. The following definitions have been used throughout the assessment.
- a. Materials are defined as physical resources that are used across the lifecycle of a development. Examples include key construction materials such as concrete, aggregate, asphalt and steel.
  - b. Wastes are defined as including surplus spoil, scrap, recovered spills, unwanted surplus materials, packaging, office waste, wastewater, broken, worn-out, contaminated or otherwise spoiled plant, equipment, and materials.
- 6.13.26 To inform the assessment, the national and regional availability (consumption/sales) of key construction materials and recovery rates for key construction materials and other construction wastes relevant to the Scheme were reviewed.
- 6.13.27 All management of waste, during construction, operation and decommissioning, will be in accordance with the relevant regulations. Waste will be transported by licensed waste carriers to waste management sites which hold the necessary regulatory authorisation and/or permits for those wastes consigned to them. These measures are set out in the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**, **Framework Operational Environmental Management Plan [EN010142/APP/7.9]** and **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**.
- 6.13.28 Construction materials required to construct the Scheme are unlikely to be required in large quantities e.g., they will represent less than 1% of regional or national construction material availability. Therefore, **no significant** effects are anticipated.
- 6.13.29 With the embedded mitigation measures in place, the overall quantities of construction waste are anticipated to be a very small percentage of non-hazardous and hazardous landfill capacity (<1%). At this stage the potential for generation of some surplus excavated material cannot be ruled out, but the quantities involved would be not significant in the context of regional landfill capacity and would only be disposed of to landfill as a last resort. It is concluded that **no significant** effects are expected during construction.
- 6.13.30 Materials required to operate the Scheme are unlikely to be required in large quantities and **no significant** effects are anticipated.
- 6.13.31 During operation, including maintenance activities, waste generation is expected to be negligible, since solar PV panels do not generate any waste as part of the energy production process. However, it is expected that there will be requirement for periodic replacement of some of the solar farm elements. Waste generated by maintenance activities such as component replacement during the operational life of the Scheme will be managed in the same way as waste from the final decommissioning of the Scheme. Recycling of PV panels will be prioritised as set out within the **Framework Operational Environmental Management Plan [EN010142/APP/7.9]**.

Therefore, **no significant** effects are expected during the operation of the Scheme.

6.13.32 At the end of the Scheme's operational life, it will be decommissioned.

Recycling will be prioritised as set out within the **Framework Decommissioning Environmental Management Plan**

**[EN010142/APP/7.10]**. Recycling routes are generally available for decommissioning materials at present, and it is likely that there will be even greater opportunities for recycling in the future, not least because the market will have expanded to meet demand as solar PV installations increase. A number of new investments in solar PV recycling have been announced and an 80% recovery rate is reported. **No significant** effects are expected during the decommissioning of the Scheme. The overall quantities of decommissioning waste are anticipated to be a very small percentage of non-hazardous and hazardous landfill capacity (<1%).

## Electric and Electro-Magnetic Fields

6.13.33 This section summarises the effects of the Scheme on electric and electro-magnetic fields.

6.13.34 Electric fields are the result of voltages applied to electrical conductors and equipment and can easily be blocked by fences, shrubs and buildings. Electro-magnetic fields are produced by the flow of electric current however are not typically blocked by materials.

6.13.35 No overhead electricity cables will be used or constructed as part of the Scheme. With the exception of relatively short lengths of on-site electrical cabling connecting the solar panels and the inverters (which is typically above ground level and fixed to the mounting structure, or to other parts of nearby components), all cables will be buried underground. Underground cables eliminate the electric field altogether as it is screened out by the casing around the cables themselves, and therefore the assessment only considered electro-magnetic fields.

6.13.36 Using National Grid's maximum known levels of electro-magnetic field generation for 400 kV cables, the assessment considered that as a worst case a residential receptor would need to be within 5 m of the centreline of an Interconnecting Cable or Cable Route Corridor cable, and for the cable to be overlapped by other electricity infrastructure for the industry standard 'reference levels' to be approached and for potentially significant effects to occur.

6.13.37 There are no residential properties within the Order limits. The nearest properties are immediately adjacent to the Order limits; however, it is unlikely that cables will be installed within 10m of any property due to the need for construction vehicles to manoeuvre both sides of the trench within the working width. Therefore, **no significant** effects to residential receptors are predicted to occur.

6.13.38 Some PRow do cross over the Principal Site and Cable Route Corridor. The presence of the public either directly above or adjacent to underground cables associated with the Scheme would be transient, with the individuals using the PRow exposed to electro-magnetic fields from the cables for only

very short periods of time. It is considered that the level of exposure to users of PRow would be similar to that associated with general household appliances. Therefore, **no significant** effects to users of PRow are predicted to occur.

6.13.39 In addition, the combination of sealed cabling and a buried depth of at least 5 m below the bed of the River Trent is considered sufficient to reduce electro-magnetic fields to levels that are unlikely to be perceivable to fish species transiting along the River Trent and limited to a very small area. As such, **no significant effect** on fish has been identified.

## 6.14 Effect Interactions

### Introduction

6.14.1 The potential for effect interactions as a result of the Scheme are summarised in **Chapter 18: Cumulative Effects and Interactions** of the Environmental Statement [EN010142/APP/6.1].

6.14.2 Effect interactions are the combined effect of individual impacts from the Scheme that are considered likely to result in a new or different likely significant effect, or an effect of greater significance, than any one of the impacts on their own. The assessment draws on the assessment of impacts provided in **Chapters 6 to 17** of the Environmental Statement [EN010142/APP/6.1].

6.14.3 The effect interactions screening exercise concluded that potential effect interactions can occur for the following receptors:

- a. Neighbouring community facilities (during construction and operation);
- b. Neighbouring residential properties (during construction and operation);and
- c. Non-motorised user routes (construction only).

6.14.4 The screening exercise also identified a number of effect interactions that are already assessed within the Environmental Statement and sign posts to these assessments as necessary. These were:

- a. Cultural Heritage (Section 6.4 of this Non-Technical Summary);
- b. Ecology and Nature Conservation (Section 6.5 of this Non-Technical Summary); and
- c. Socio-economics and Land Use (Section 6.10 of this Non-Technical Summary).

### Construction

6.14.5 During construction there is the potential for effect interactions to occur from air quality, noise and vibration, transport and access, and landscape and visual effects on neighbouring residential properties and non-motorised users. The adverse effects may lead to an increased sense of construction disturbance; however, the combined effect will be short-term temporary, transient and unlikely to be continuous throughout the construction period.



6.14.6 The combined effects will be managed and minimised in accordance with the measures outlined in the **Framework Construction Environmental Management Plan (CEMP) [EN010142/APP/7.8]**. However, a residual **significant** effect has been identified at Hermitage Low Farmhouse, Common Lane residential property, and the non-motorised users of A631 and School Lane. In the case of each significant effect interaction, the effect is already significant due to one of the individual effects before considering other impacts that may add to the effect.

## Operation

6.14.7 During operation, there is the potential for effect interactions to occur, where residential properties within the vicinity of the Principal Site are affected by operational noise and visual effects. These are likely to result in a **significant** effect in Year 1 (mostly due to significant visual effects) but will reduce to **not significant** by Year 15 once landscaping has matured and screens the Scheme from views.

## Decommissioning

6.14.8 The decommissioning effects are assessed to be the same as, or less than, those for construction phase.

## 6.15 Cumulative Effects

### Introduction

6.15.1 Cumulative effects have the potential to occur where two (or more) proposed schemes are within close enough proximity for them to both have environmental effects on the same receptor. This has been considered in each of the technical assessments.

6.15.2 The cumulative effects assessment methodology is based on the Planning Inspectorate's Advice Note 17 (Ref. 22) on the assessment of cumulative effects, which identifies a four-stage approach. This four-stage approach sets out a robust process for the identification of a short list of cumulative scheme to be considered within the cumulative effects assessment.

6.15.3 The potential for cumulative effects is summarised in **Chapter 18: Cumulative Effects and Interactions** of the Environmental Statement **[EN010142/APP/6.1]**.

### Mitigation and Monitoring

6.15.4 Significant work has been undertaken to minimise cumulative effects associated with the Scheme and Gate Burton Energy Park [EN010131], West Burton Solar Project [EN010132] and Cottam Solar Project [EN010133]. Shared mitigation measures between the Scheme and these other solar DCOs have been identified with regards to cultural heritage, ecology and transport. Further information on the collaborative approach can be found within the **Joint Report on Interrelationships between Nationally Significant Infrastructure Projects [EN010142/APP/7.6]**.

## Assessment of Effects

### Construction Effects

- 6.15.5 Suitable mitigation to manage the adverse environmental effects of the Scheme are detailed within the **Framework Construction Environmental Management Plan [EN010142/APP/7.8]**. It is assumed that any nearby construction/decommissioning sites would operate to a similar level of good practice in accordance with their own Environmental Management Plans.
- 6.15.6 With the exception of the following **significant** landscape and visual and socio-economic cumulative effects, all other cumulative effects during construction were assessed as **not significant**:
- a. Temporary significant adverse effect on the character of LLCA 2c Lincoln Cliff Open Farmland, LLCA3a Till Vale Open Farmland and LLCA5a Trent Valley Meadowlands;
  - b. Temporary significant adverse effect on the following viewpoints:
    - i. Viewpoint 4 Middle Street above Harpswell;
    - ii. Viewpoint 7 B1398 Middle Street, Glentworth Cliff Farm;
    - iii. Viewpoint 9 Kexby Road, west of Glentworth Grange;
    - iv. Viewpoint 13 Public footpath (Hems/787/2) on Lincoln Cliff, Hemswell (Millfield);
    - v. Viewpoint CRC3 Flat Tops, Normanby by Stow;
    - vi. Viewpoint CRC5 Marton - Poplar Farm (Footpath Mton/68/1);
    - vii. Viewpoint CRC6 Footpath (Bram/66/1), South of Trent Port, Marton; and
    - viii. Viewpoint CRC7 Trent Valley Way, Cottam (Cottam FP1).
  - c. Temporary significant beneficial effect from the generation of construction employment at a local scale (within West Lindsey and Bassetlaw Districts).

### Operational Effects

- 6.15.7 With the exception of the following **significant** landscape and visual cumulative effects, all other cumulative effects during operation were assessed as **not significant**:
- a. Short term significant adverse effect (Year 1 effect during winter before planting has been established) and long term significant adverse effect (Year 15 during summer as planting has been established) on the character of the LLCA3a Till Vale Open Farmland (**Figure 7** of this Non-Technical Summary).
  - b. Short term significant adverse effect (Year 1 effect during winter before planting has been established) on the following viewpoints (**Figure 8** of this Non-Technical Summary):
    - i. Viewpoint 4 Middle Street above Harpswell;
    - ii. Viewpoint 7 B1398 Middle Street, Glentworth Cliff Farm;
    - iii. Viewpoint 9 Kexby Road, west of Glentworth Grange;

- iv. Viewpoint 13 Public footpath (Hems/787/2) on Lincoln Cliff, Hemswell (Millfield);
- c. Long term significant adverse effect (Year 15 during summer as planting has been established) on the following viewpoints (**Figure 8** of this Non-Technical Summary):
  - i. Viewpoint 7 B1398 Middle Street, Glentworth Cliff Farm;
  - ii. Viewpoint 13 Public footpath (Hems/787/2) on Lincoln Cliff, Hemswell (Millfield).

### **Decommissioning Effects**

- 6.15.8 Suitable mitigation to manage the adverse environmental effects of the Scheme are detailed within the **Framework Decommissioning Environmental Management Plan [EN010142/APP/7.10]**. It assumed that any nearby construction/decommissioning sites would operate to a similar level of good practice in accordance with their own Environmental Management Plans.
- 6.15.9 Assessment of the cumulative effects during the decommissioning of the Scheme concluded that all potential cumulative effects would be no worse than those identified for the construction phase.

## **7. Summary and Conclusions**

- 7.1.1 The Environmental Statement explains the findings of the EIA process that has been undertaken for the Scheme. Feedback from the formal consultation process has been taken into account when preparing the DCO Application and in undertaking the EIA process.
- 7.1.2 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 Scheme. These are secured through appropriate requirements and controls within the DCO Application.
- 7.1.3 During the construction of the Scheme, there is potential for **significant** adverse residual effects on three landscape character areas and 13 representative viewpoints. In addition, the construction of the Scheme has the potential to result in **significant** adverse residual effects on the B1241, North of Fleets Road as a result of severance, pedestrian delay and changes in non-motorised user amenity. **Significant** adverse effects have also been identified as a result of an increased sense of disturbance due to the combined effects from air quality, noise and vibration, transport and access, and landscape and visual impacts on Hermitage Low Farmhouse, Common Lane and the non-motorised users of A631 and School Lane. Furthermore, **significant** cumulative adverse effects have been identified on three landscape character areas and eight representative views. A beneficial **significant** cumulative effect has been identified from construction employment. All other environmental effects of the construction of the Scheme were assessed as **not significant**.

- 7.1.4 The operation of the Scheme is predicted to result in some **significant** adverse effects on landscape and visual amenity prior to the establishment of planting. By Year 15, when planting has matured, only one **significant** landscape and three **significant** visual effects remain.
- 7.1.5 The operation of the Scheme will also have a **significant beneficial** effect on climate (greenhouse gases) due to the nature of the Scheme (renewable energy) by displacing the needs for other forms of conventional energy generation that would emit greenhouse gases. There are also predicted to be **significant beneficial** effects associated with the proposed habitat creation and enhancement of habitat within the Principal Site which would achieve a minimum 10% biodiversity net gain. In addition, the Scheme would result in **significant beneficial effects** on the soil resource and farming circumstances within the Principal Site.
- 7.1.6 **Significant adverse effects** have also been identified as a result of an increased sense of disturbance due to the combined effects from operational noise and landscape and visual impacts on neighbouring residential properties, however, these would reduce to **not significant** with the maturing of landscape screening. **Significant adverse cumulative effects** have been identified on one landscape character area and four representative views, albeit with the maturing of landscape planting, only two significant visual effects remain.
- 7.1.7 All other environmental effects of the operation of the Scheme were assessed as **not significant**.
- 7.1.8 Decommissioning effects would be no greater than those set out for construction. This is likely to overestimate the actual effects, which are expected to be shorter in duration and lower in magnitude.

## 8. References

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- Ref. 22 The Planning Inspectorate (2015), Advice Note 17: Cumulative effects assessment relevant to nationally significant infrastructure projects.

## 9. Abbreviations

<b>Abbreviation/Term</b>	<b>Definition</b>
AC	Alternating Current
ALC	Agricultural Land Classification
AoD	Above Ordnance Datum
BESS	Battery and Energy Storage System
BMV	Best and Most Versatile
BNG	Biodiversity Net Gain
CC	Climate Change
CCRA	Climate Change Risk Assessment
CCTV	Closed Circuit Television
CIEEM	Chartered Institute of Ecology and Environmental Management
DC	Direct Current
DCO	Development Consent Order
EcoCOW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EPUK	Ecology and Environmental Management
FTE	full-time equivalent
GHG	Greenhouse gas
GLNP	Greater Lincolnshire Nature Partnership
GLVIA3	Guidelines for Landscape and Visual Impact Assessment 3
GPs	General Practices
Ha	Hectare
HGV	Heavy Goods Vehicles
IAQM	Institute of Air Quality Management
ICCI	In combination Climate Change Impacts
INNS	Invasive non-native Species
Km	Kilometre
KV	Kilo Volt
LGVs	Light goods vehicle
LLCA	Local Landscape Character Area
LVIA	Landscape and Visual Impact Assessment
LWS	Local Wildlife Site
m	Metre
NBGRC	Nottinghamshire Biological and Geological Records Centre
NCA	National Character Area
NPS	National Policy Statement
NSIP	Nationally Significant infrastructure Project
OS	Ordnance Survey
PRoW	Public Rights of Way

**Abbreviation/Term    Definition**

PV	Photovoltaic
RAF	Royal Air Force
SAC	Special Area of Conservation
SPA	Special Protection Area
SSSI	Special Site of Scientific Interest
STEM	Science, technology, engineering and mathematics
SuD	Sustainable Drainage Systems
UK	United Kingdom



## 10. Figures

Figure 1 – The Order Limits

Figure 2 – Environmental Constraints Plan

Figure 3 – Indicative Principal Site Layout

Figure 4 – Potential Development Zones

Figure 5 – Refinement of the Site Search Area

Figure 6 – Areas of retained optionality within the Cable Route Corridor

Figure 7 – Local Landscape Character Areas

Figure 8 – Representative Viewpoints and Photomontages Locations - Principal Site

Figure 9 - Representative Viewpoints and Photomontages Locations – Cable Route Corridor

Figure 10 – Local PRow Network



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**NOTES**  
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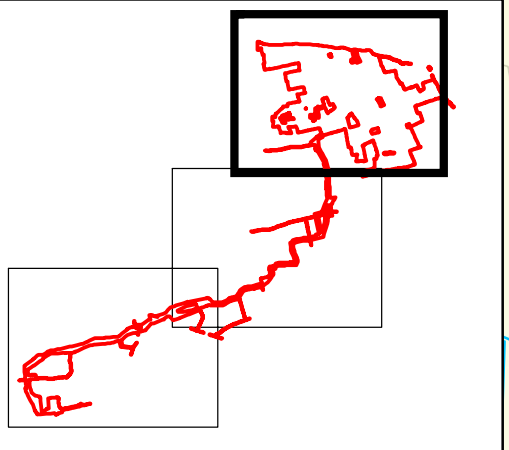
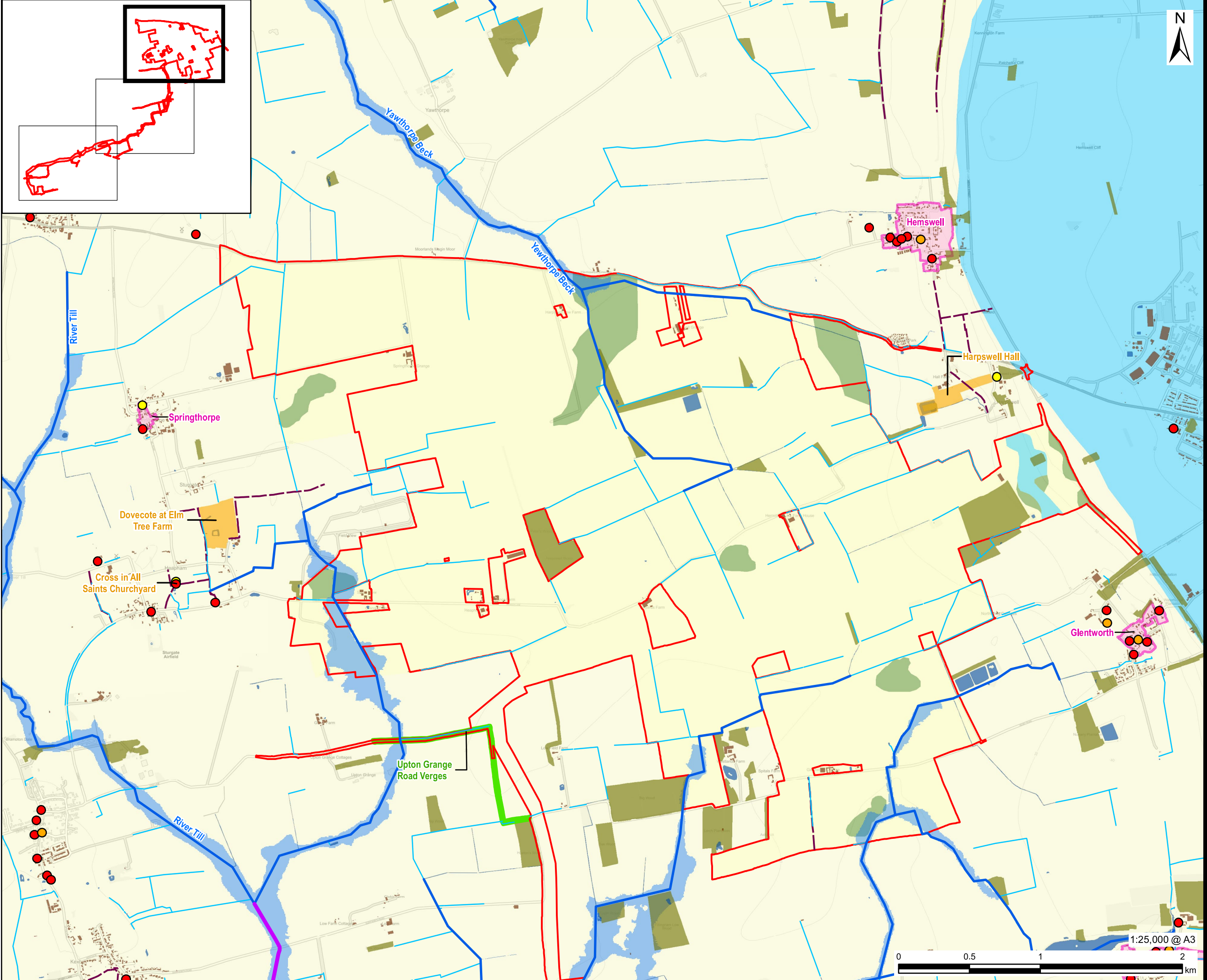
**ISSUE PURPOSE**  
NTS  
**PROJECT NUMBER**  
60677969

**FIGURE TITLE**  
Order limits

**FIGURE NUMBER**  
Figure 1

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# AECOM

**PROJECT**  
Tillbridge Solar Project

**CLIENT**  
Tillbridge Solar Ltd

**CONSULTANT**  
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- LEGEND**
- Order limits
  - Main River
  - Ordinary Watercourse
  - Surface Water
  - PROW
  - Lincolnshire Local Wildlife Site
  - Building
  - Waterbody
  - National Forest Inventory
  - Scheduled Monument
  - Conservation Area
  - Flood Zone 3
- Listed Building (Grade)**
- I
  - II\*
  - II
- Agricultural Land Classification (Grade)**
- Grade 2
  - Grade 3a
  - Grade 3b

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NTS

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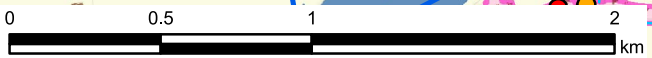
60677969

**FIGURE TITLE**

Environmental Constraints Plan

**FIGURE NUMBER**

Figure 2-A



1:25,000 @ A3

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**LEGEND**

- Order limits
- Main River
- Ordinary Watercourse
- Surface Water
- PROW
- Ancient Woodland
- Ancient & Semi-Natural Woodland
- Ancient Replanted Woodland
- Lincolnshire Local Wildlife Site
- Building
- Waterbody
- National Forest Inventory
- Scheduled Monument
- Flood Zone 3

**Listed Building (Grade)**

- I
- II\*
- II

**Agricultural Land Classification (Grade)**

- Grade 3a
- Grade 3b

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**ISSUE PURPOSE**

**NTS**  
**PROJECT NUMBER**  
60677969

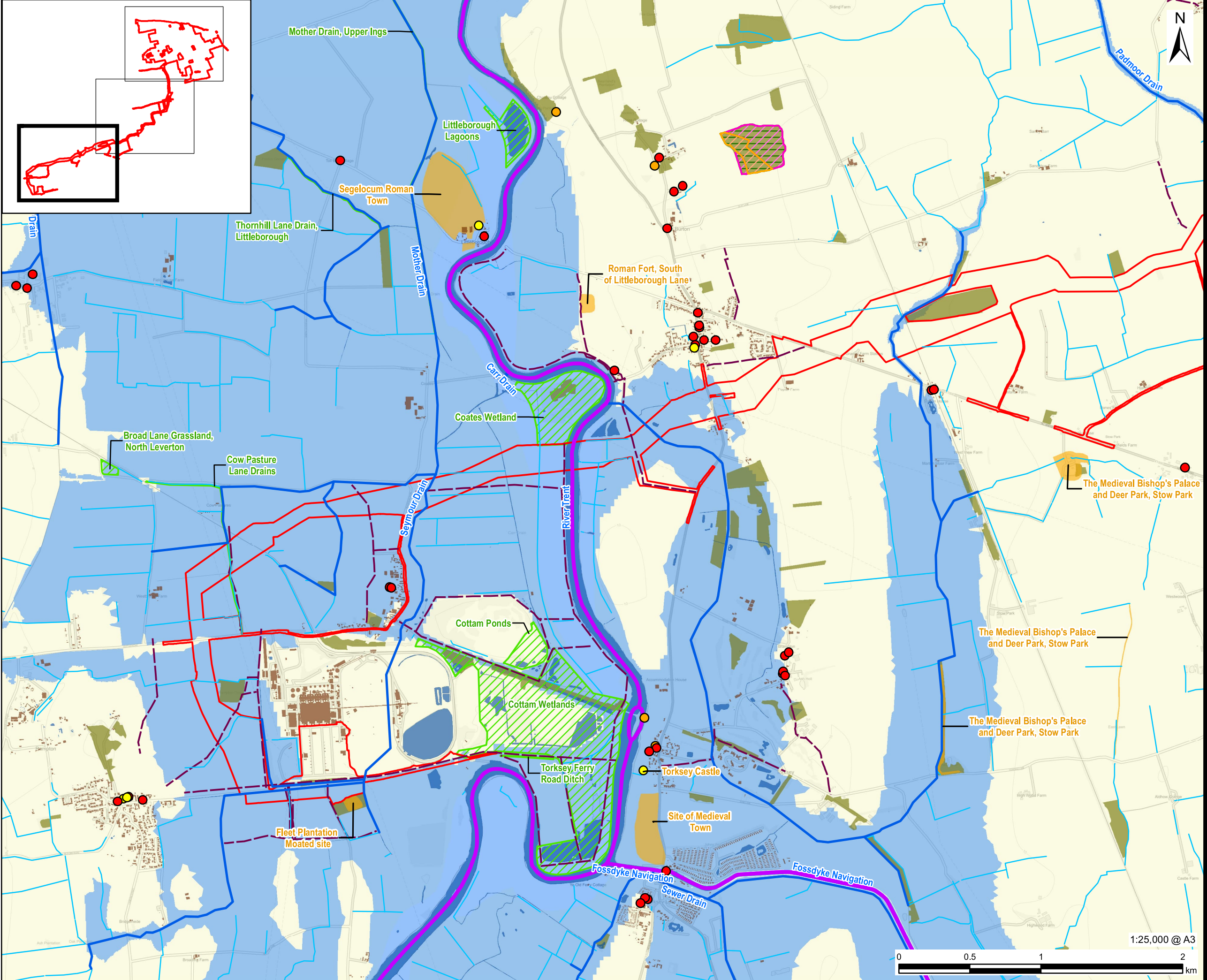
**FIGURE TITLE**  
Environmental Constraints Plan

**FIGURE NUMBER**  
Figure 2-B

Scale: 1:25,000 @ A3  
Scale bar: 0, 0.5, 1, 2 km

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**LEGEND**

- Order limits
- Main River
- Ordinary Watercourse
- Surface Water
- PROW
- Ancient Woodland
- Ancient & Semi-Natural Woodland
- Ancient Replanted Woodland
- Nottinghamshire Local Wildlife Site
- Building
- Waterbody
- National Forest Inventory
- Scheduled Monument
- Flood Zone 3

**Listed Building (Grade)**

- I
- II\*
- II

**Agricultural Land Classification (Grade)**

- Grade 3b

**NOTES**

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**ISSUE PURPOSE**

**NTS**  
**PROJECT NUMBER**  
60677969

**FIGURE TITLE**  
Environmental Constraints Plan

**FIGURE NUMBER**  
Figure 2-C

Scale: 1:25,000 @ A3

0 0.5 1 2 km

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**LEGEND**

**ORDER LIMITS (SITE BOUNDARY)**

— PRINCIPAL SITE ORDER LIMITS

**EXISTING FEATURES AND CONSTRAINTS**

EXISTING WOODLAND AND HEDGEROWS WITHIN AND AROUND SITE

PUBLIC RIGHT OF WAY

TEMPORARY VOLUNTARY BRIDLEWAY (STURGATE)

**INDICATIVE PROPOSED SCHEME**

PROPOSED AREAS OF SOLAR PANELS WITH IMPROVED GRASSLAND BENEFIT

PROPOSED SOLAR STATIONS AND BATTERY ENERGY STORAGE STATIONS (BESS)

PROPOSED GRAVEL MAINTENANCE ACCESS TRACKS

PROPOSED INFRASTRUCTURE: SUBSTATIONS AND SOLAR FARM CONTROL CENTRE

PROPOSED MAIN SITE ACCESS LOCATIONS

PROPOSED TIMBER/WIRE MESH DEER FENCE WITH CCTV CAMERAS ON POLES

PROPOSED NEW NATIVE WOODLAND PLANTING

PROPOSED BIODIVERSITY ZONES WITH HABITATS INCLUDING GRASSLAND (FOR GROUND NESTING BIRDS) HEDGEROWS, TREE BELTS, GRASSLAND FOR GROUND NESTING BIRDS, ISOLATED TREES, WETLANDS, SPECIES-RICH MEADOWS ETC. (REFERENCE NUMBERS TO LARGER AREAS)

PROPOSED NATIVE HEDGEROWS (INDICATIVE ALIGNMENTS)

OTHER PROPOSED AREAS OF GRASSLAND (INCLUDING SPECIES-RICH) OUTSIDE OF PANEL AREAS AND ACCESS TRACKS

SENSITIVE ARCHAEOLOGY SITES (WITH REFERENCE NUMBERS): NO DEVELOPMENT

123 PANEL AREA REFERENCE NUMBERS

PROPOSED PERMISSIVE PATH

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**ISSUE PURPOSE**

DCO Submission

**PROJECT NUMBER**

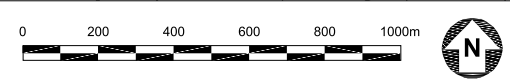
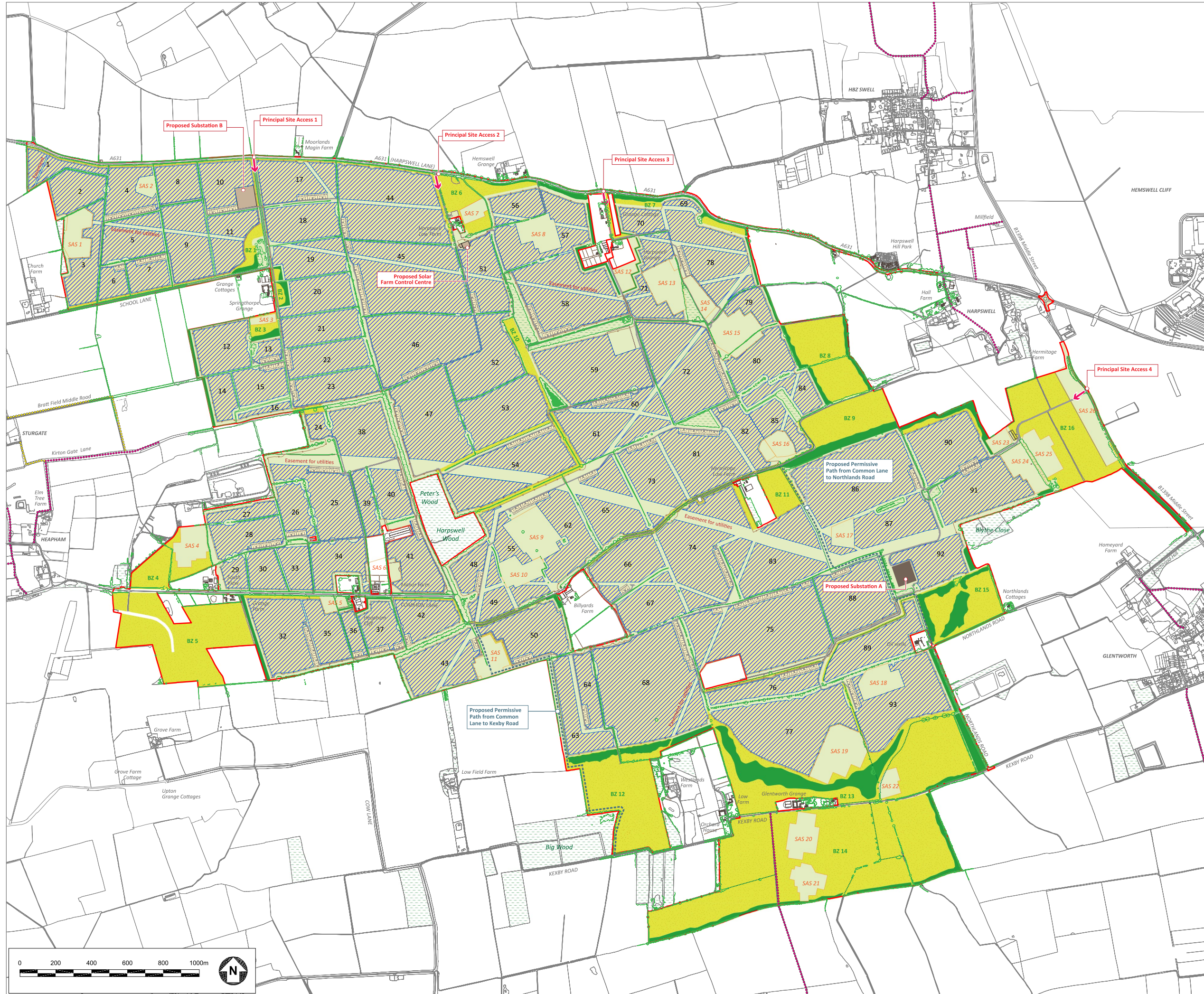
60677969

**FIGURE TITLE**

Indicative Principal Site Layout Plan

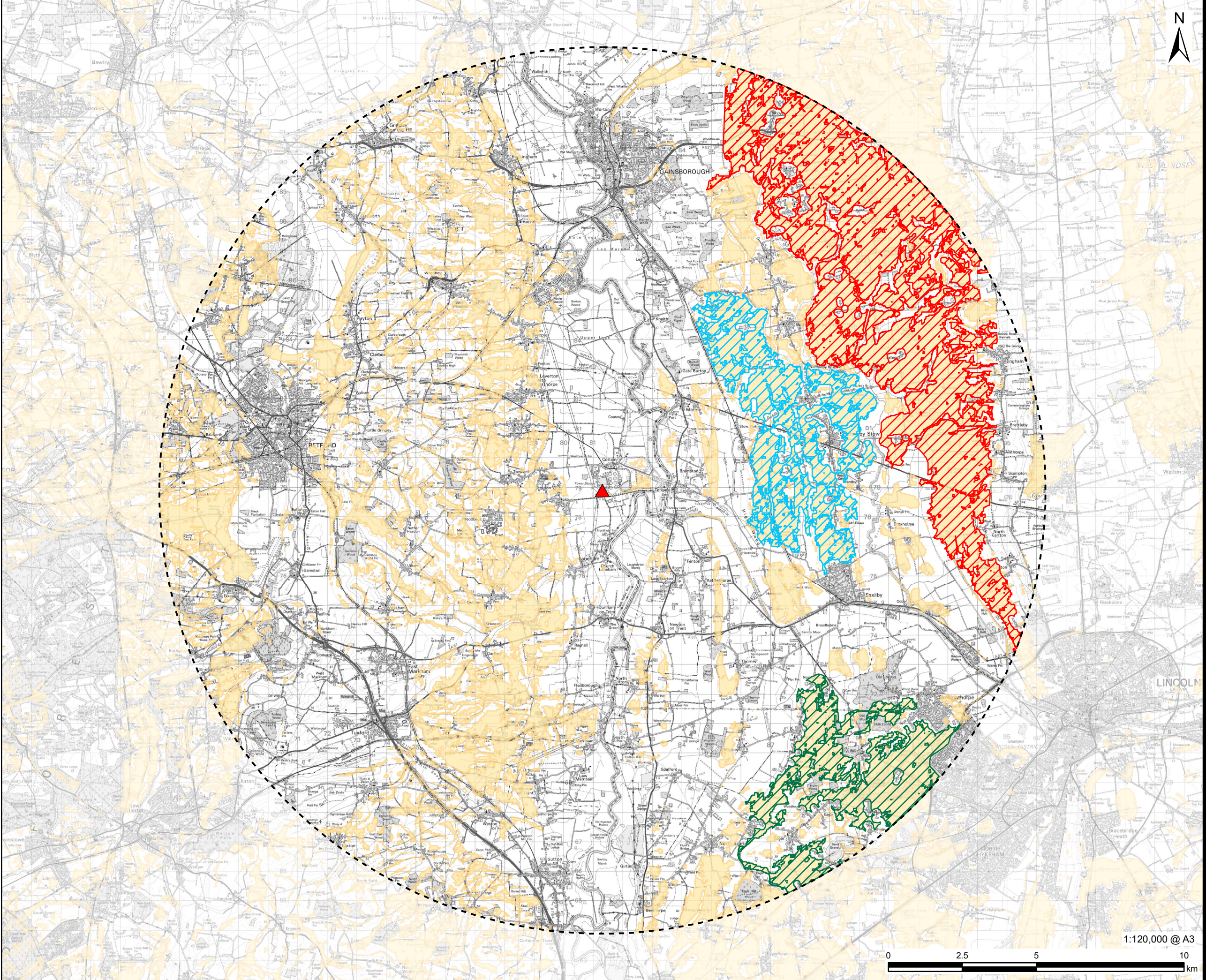
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Figure 3



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- LEGEND**
- National Grid Cottam Substation
  - 15km Search Area
  - Unconstrained Area
  - Zone Boundary**
  - Zone A
  - Zone B
  - Zone C

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NTS

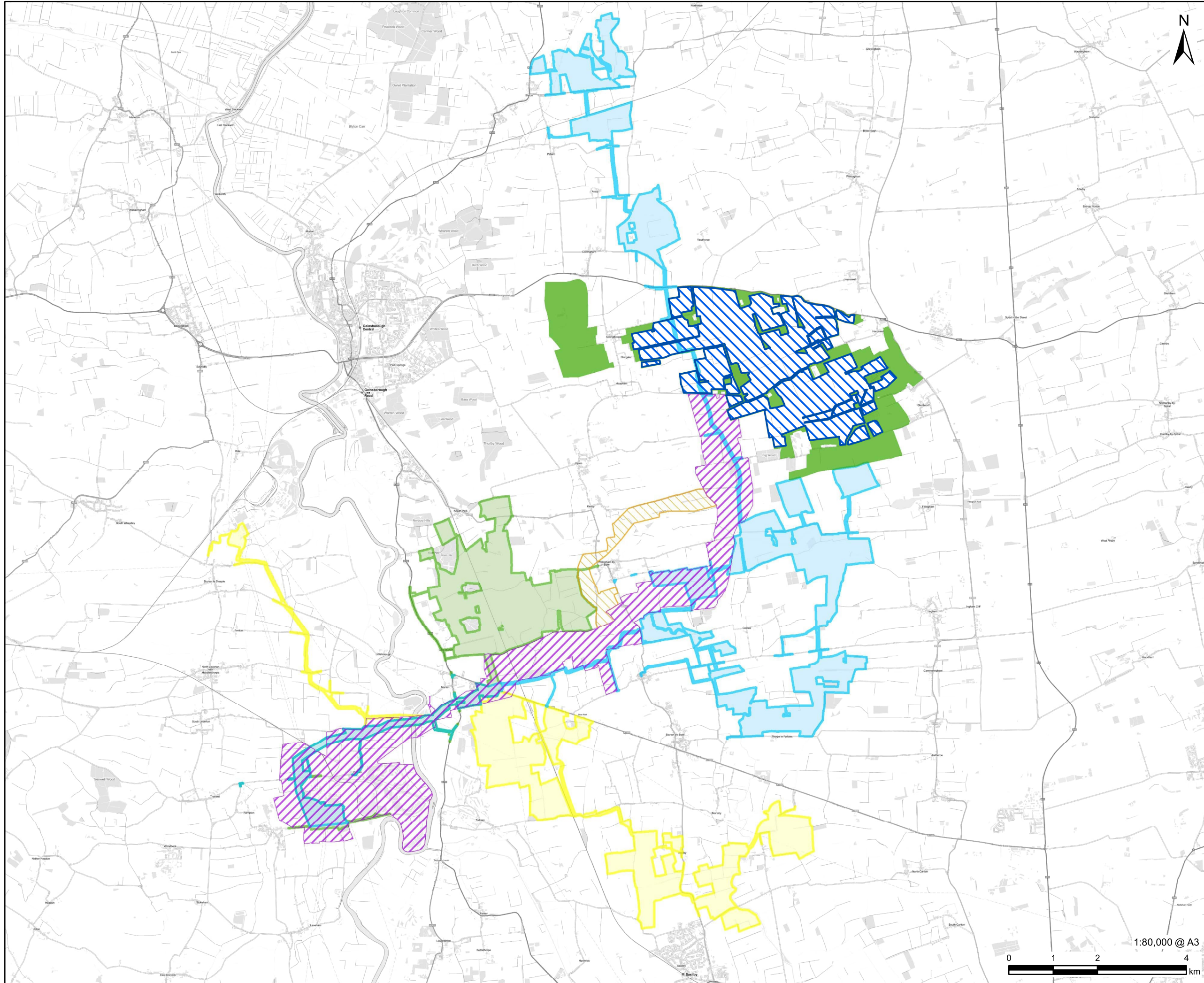
**PROJECT NUMBER**  
60677969

**FIGURE TITLE**  
Potential Development Zones

**FIGURE NUMBER**  
Figure 4



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




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- LEGEND**
-  Tillbridge Solar Indicative Developable Area
  -  Tillbridge Solar Project Alternative Cable Route
  -  Tillbridge Solar Project Cable Route Corridor
  -  Gate Burton Boundary
  -  West Burton Energy Park Boundary
  -  Cottam Solar Project Boundary

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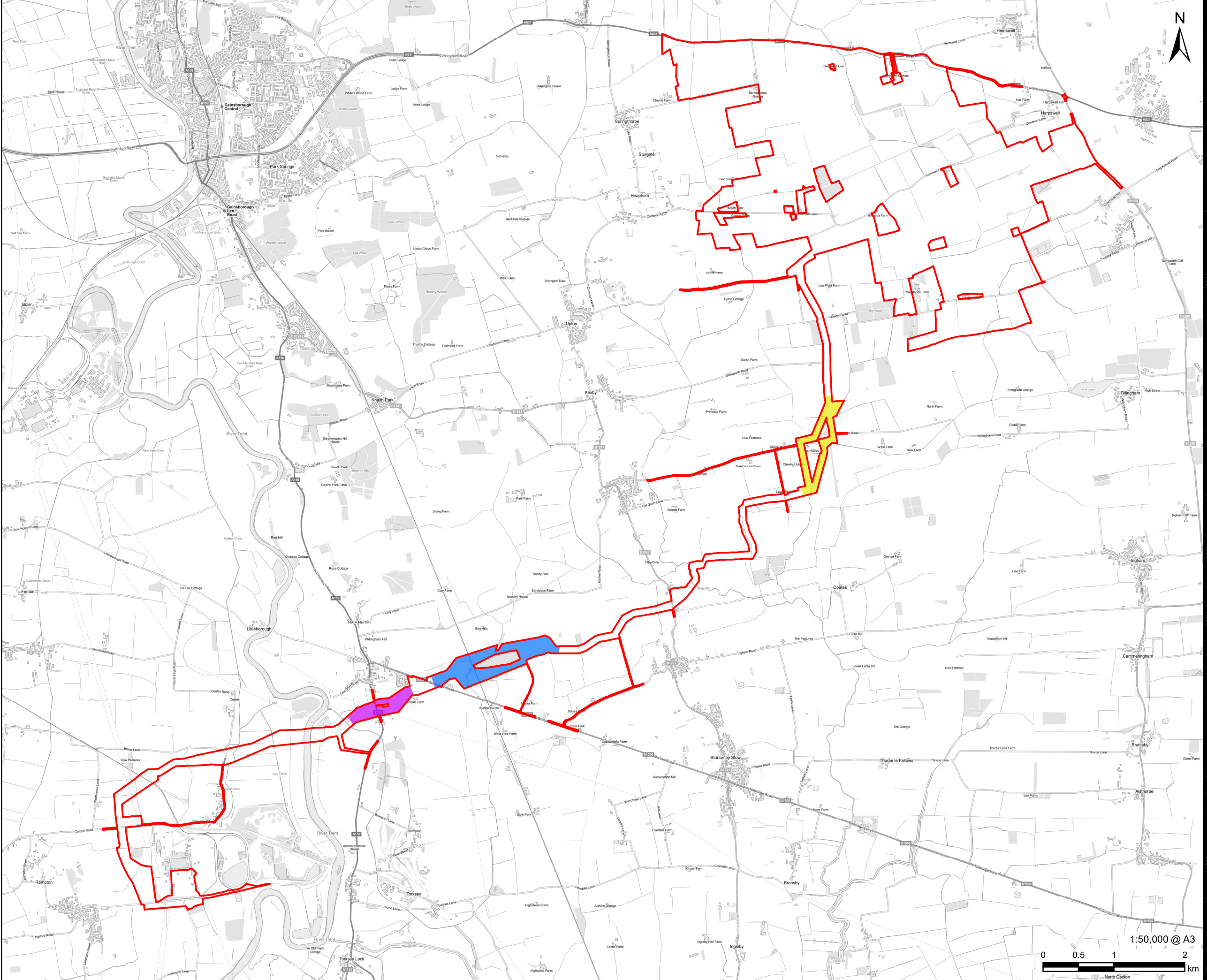
**FIGURE TITLE**  
Site Search Area Context

**FIGURE NUMBER**  
Figure 5



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Tillbridge Solar Ltd

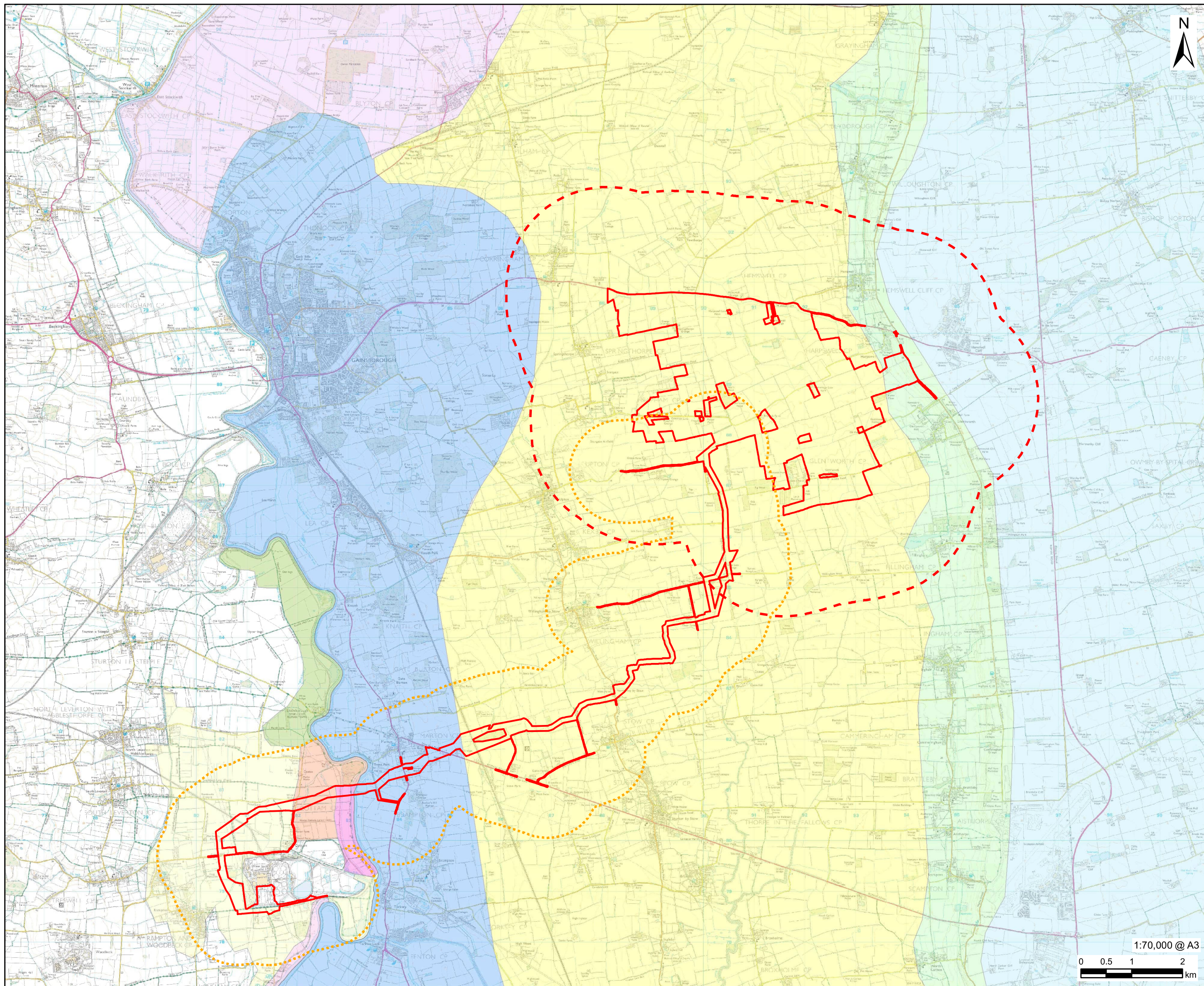
CONSULTANT  
Aldgate Tower  
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London, E1 8FA  
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LEGEND  
Order limits  
Location of Two Potential Routes  
East of Marton  
East of Willingham-by-Stow  
South of Marton

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ISSUE PURPOSE  
NTS  
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60677969  
FIGURE TITLE  
Areas of retained optionality within the Cable Route Corridor  
FIGURE NUMBER  
Figure 6

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**West Lindsey Landscape Character Assessment: Landscape Character Types**

- 1: Laughton Woods
- 2: Trent Valley
- 3: The Till Vale
- 4: The Cliff
- 5: Limestone Dip Slope

**Bassetlaw Landscape Character Assessment: Policy Zones**

- TW PZ 21 Cottam, Rampton and Church Laneham Farmlands
- TW PZ 22 Cottam River Meadowlands
- TW PZ 24 Littleborough River Meadowlands
- TW PZ 47 Laneham Cottam River Meadowlands
- TW PZ 48 Littleborough Village Meadowlands

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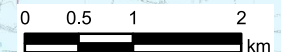
**ISSUE PURPOSE**

**NTS**  
**PROJECT NUMBER**  
60677969

**FIGURE TITLE**  
Local Landscape Character Areas



**FIGURE NUMBER**  
Figure 7

1:70,000 @ A3

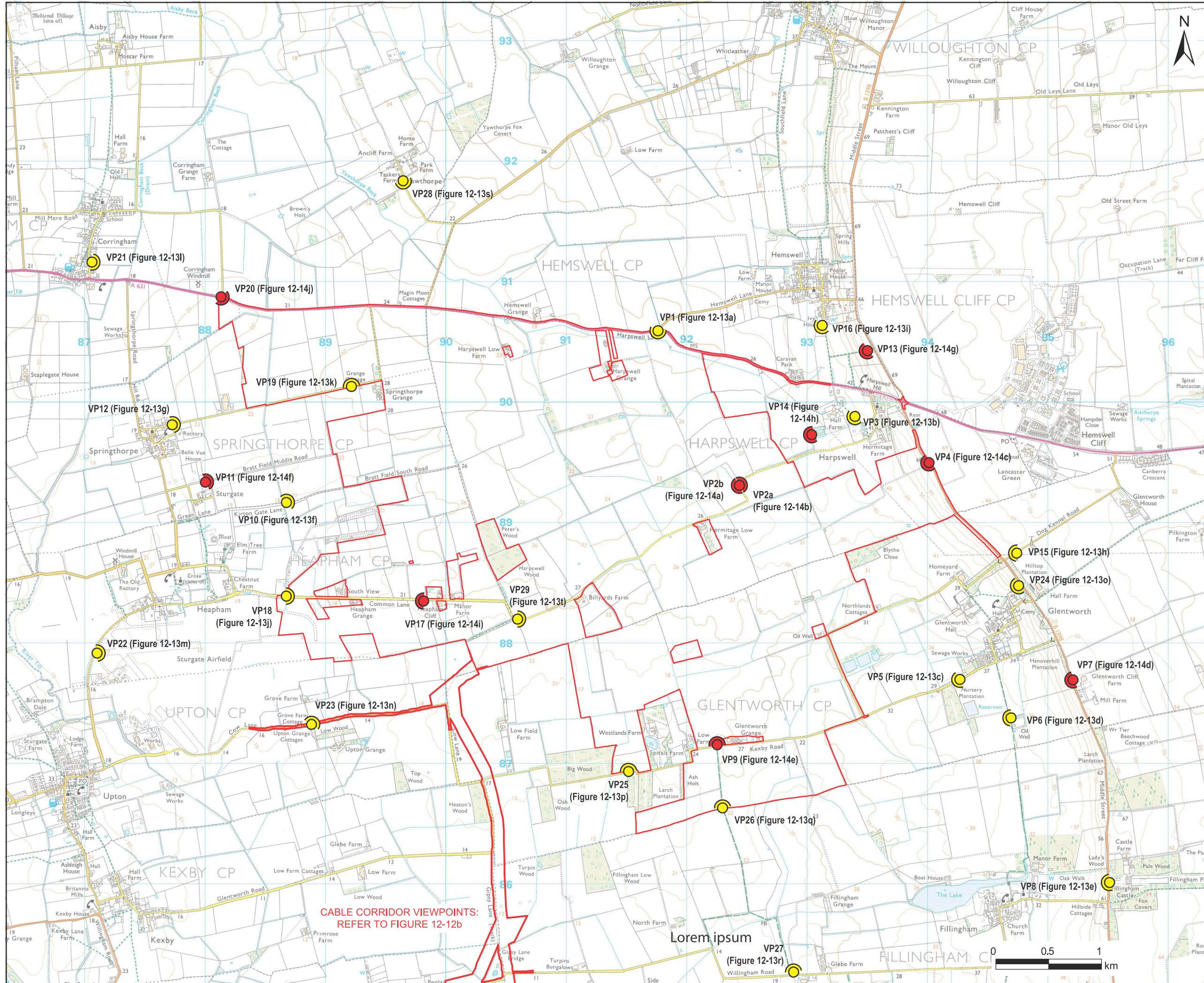


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**LVIa Representative Viewpoints**

-  Viewpoints presented as 'Type 1\*' reference views
-  Viewpoints proposed for 'Type 3\*' photomontages/visualisations

\*refer to Landscape Institute Technical Guidance Note (TGN) 06/19 'Visual Representation of development proposals'



CABLE CORRIDOR VIEWPOINTS:  
REFER TO FIGURE 12-12b

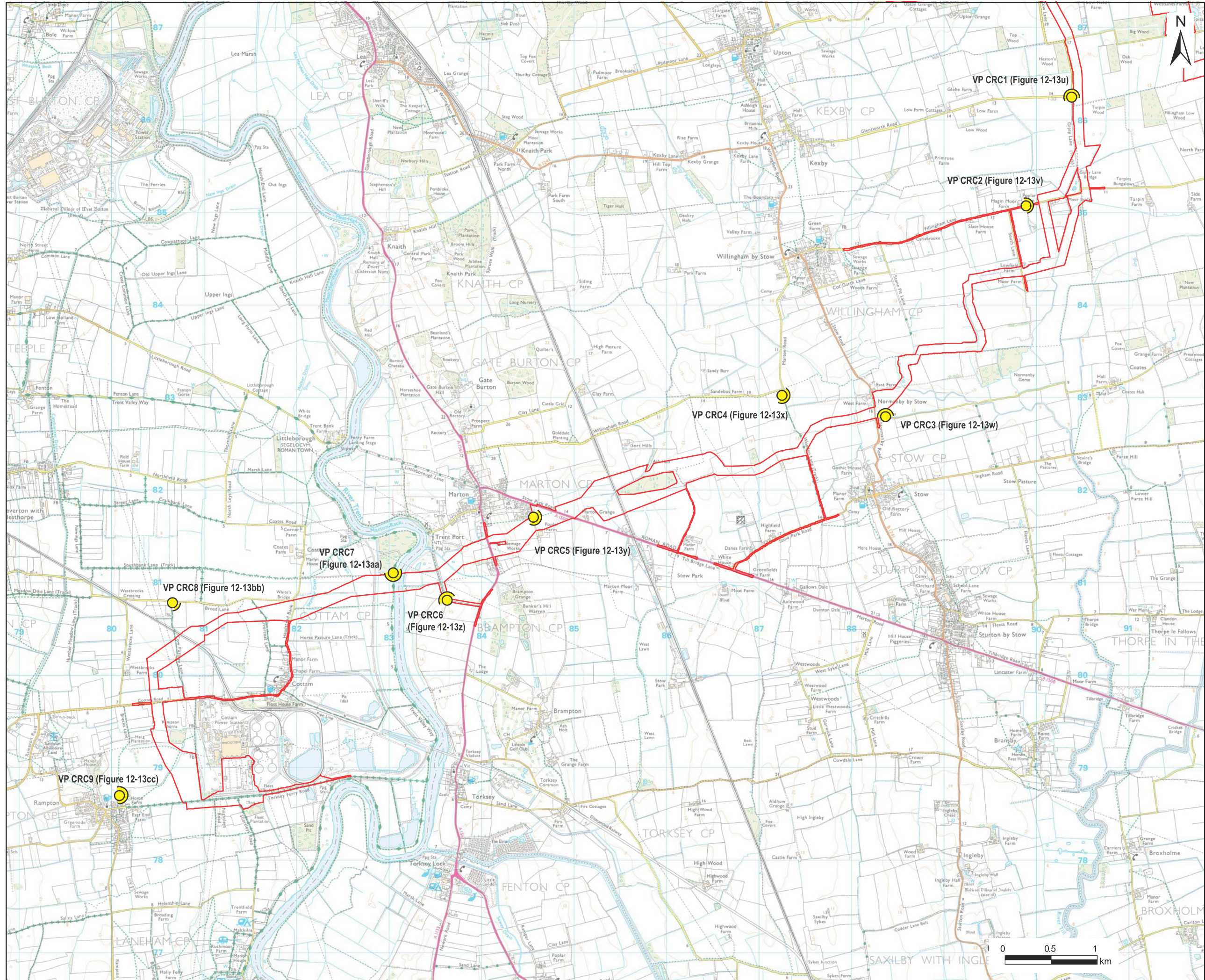
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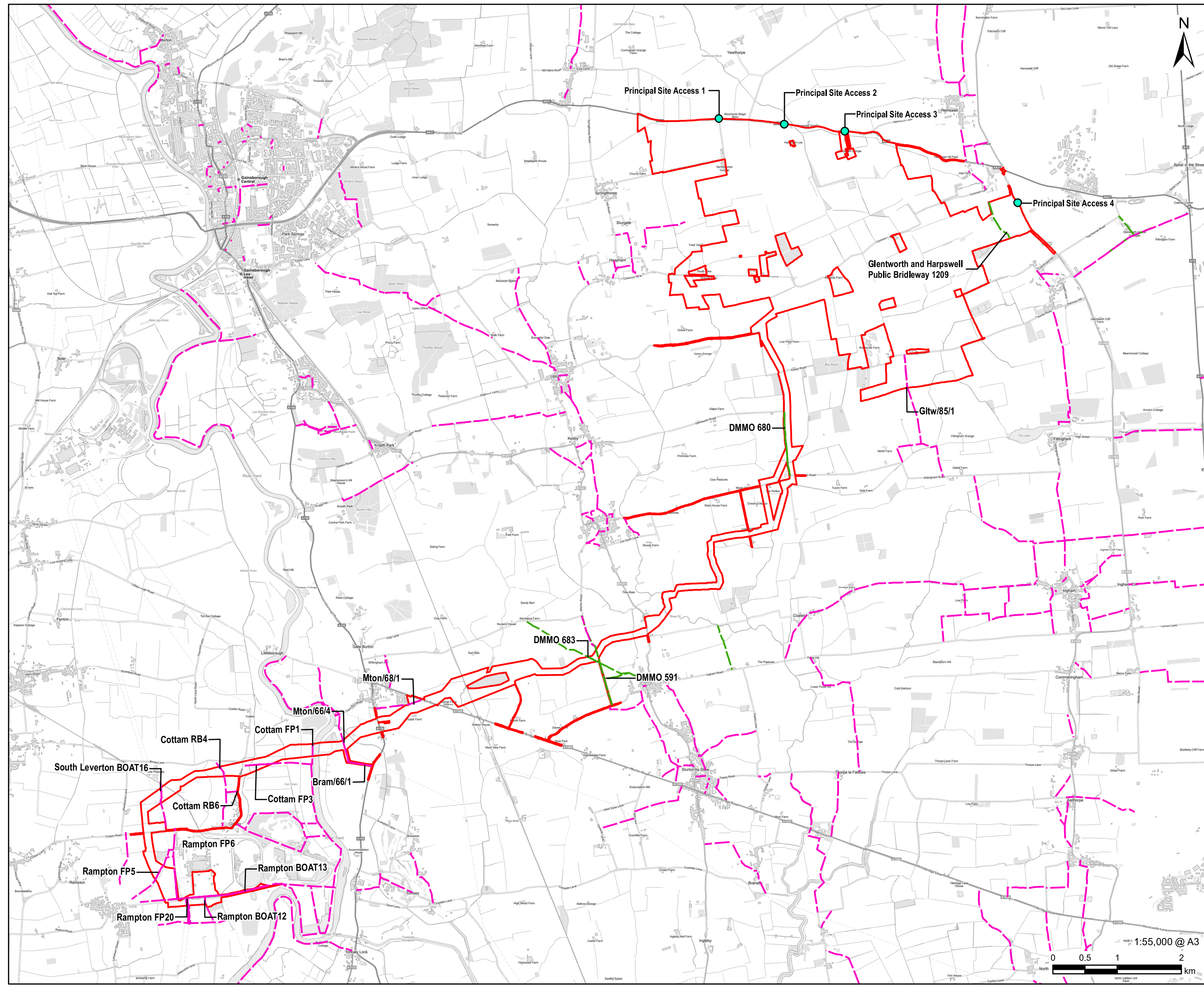
ISSUE PURPOSE  
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PROJECT NUMBER  
60677969

FIGURE TITLE  
LVIa Representative Viewpoints and Photomontage Locations: Principal Site

FIGURE NUMBER  
Figure 8

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**LEGEND**

- Order limits
- Principal Site Access
- Public Rights of Way
- Claimed Public Rights of Way

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**ISSUE PURPOSE**  
 DCO Submission

**PROJECT NUMBER**  
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**FIGURE TITLE**  
 Local PRoW Network

**FIGURE NUMBER**  
 Figure 10

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