

Development Consent Order Application for Ground Mounted Solar Panels, Energy Storage Facility,
Below Ground Grid Connection to Bicker Fen Substation and All Associated Infrastructure Works at

Land at Six Hundreds Farm, Six Hundred Drove, East Heckington, Sleaford, Lincolnshire.

Preliminary Environmental Information Report
Non-Technical Summary

Ecotricity (Heck Fen Solar) Ltd.

Prepared by Pegasus Group | June 2022 | PINS REF: EN010123



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INTRODUCTION

1.1 Introduction

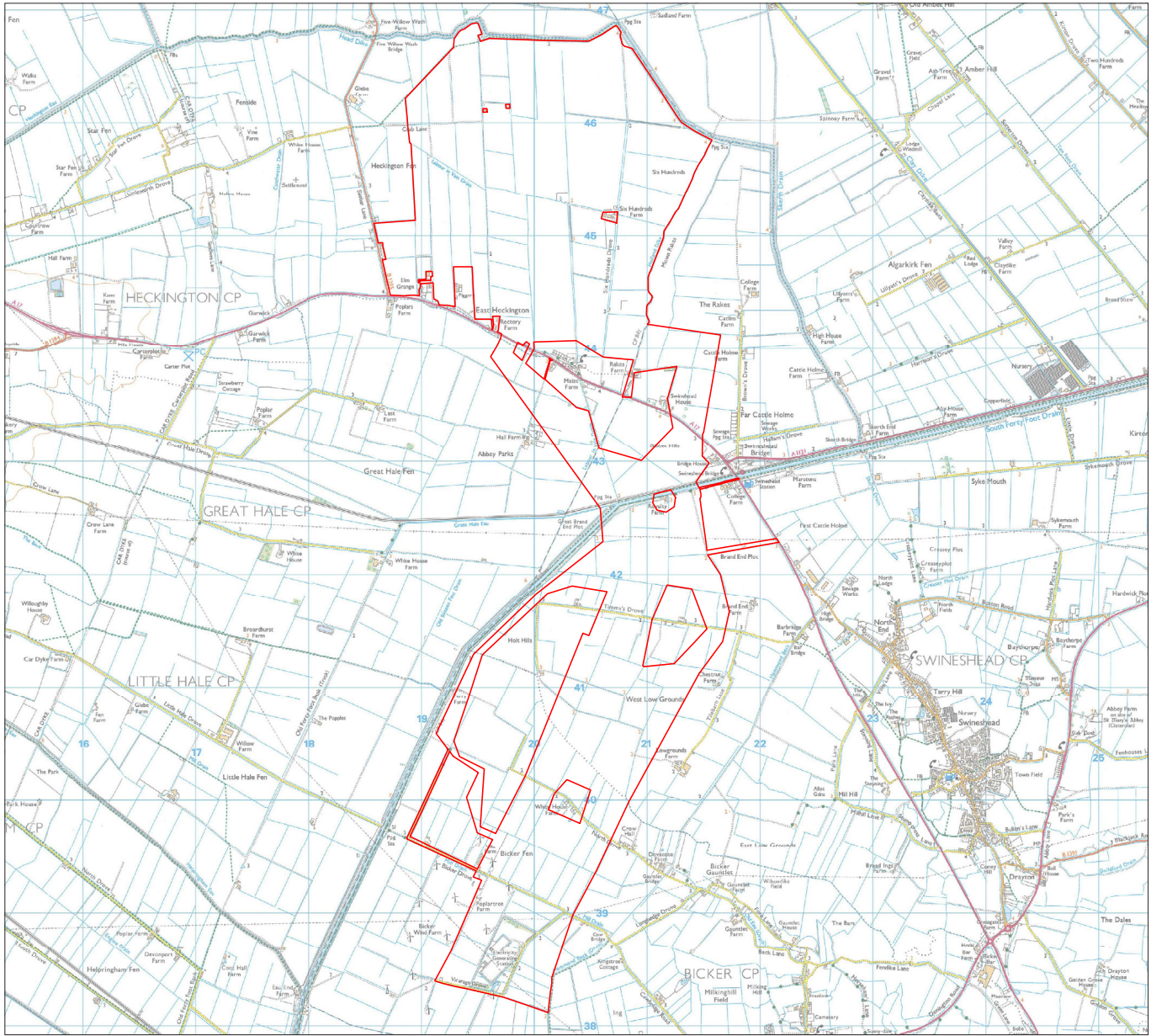
This document provides a Non Technical Summary (NTS) of the Preliminary Environmental Information Report (PEIR) which has been prepared on behalf of Ecotricity (Heck Fen Solar) Ltd (the “Applicant”) for the proposal of a ground mounted solar photovoltaic (PV) electricity generation and energy storage facility (hereafter referred to as “the Energy Park”) at Land at Six Hundreds Farm, Six Hundreds Drove, East Heckington, Sleaford, Lincolnshire.

The Applicant is planning to submit an application for a Development Consent Order (DCO) to the Secretary of State for Business, Energy, and Industrial Strategy for the construction, operation (including maintenance), and decommissioning of Heckington Fen Energy Park. The Heckington Fen Energy Park will comprise of the following three elements: the Energy Park, cable route to, and above ground works at, the National Grid Bicker Fen substation (hereafter referred to “the Proposed Development”).

Within the public consultation material, the scheme is referred to as Heckington Fen Solar Park, as the main infrastructure at the Proposed Development contains solar panels. Within the PEIR, the Proposed Development is assessed based on three elements as noted above, which includes the ‘Energy Park’, as within the main site, solar panel infrastructure and energy storage infrastructure have been technically assessed in the PEIR. The terms ‘Solar Park’ and ‘Energy Park’ have therefore been used interchangeably within some of the consultation documents. Where applicable, in the PEIR, descriptions are explicit when only referencing solar or energy infrastructure.

The Proposed Development site location is shown on **Figure 1**, and the boundary of the Energy Park is shown on **Figure 2**.

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KEY
 Site Boundary

FIGURE 1: SITE LOCATION PLAN
 SITE OVERVIEW PLAN INCORPORATING CABLE
 ROUTE CORRIDORS TO BICKER FEN SUBSTATION

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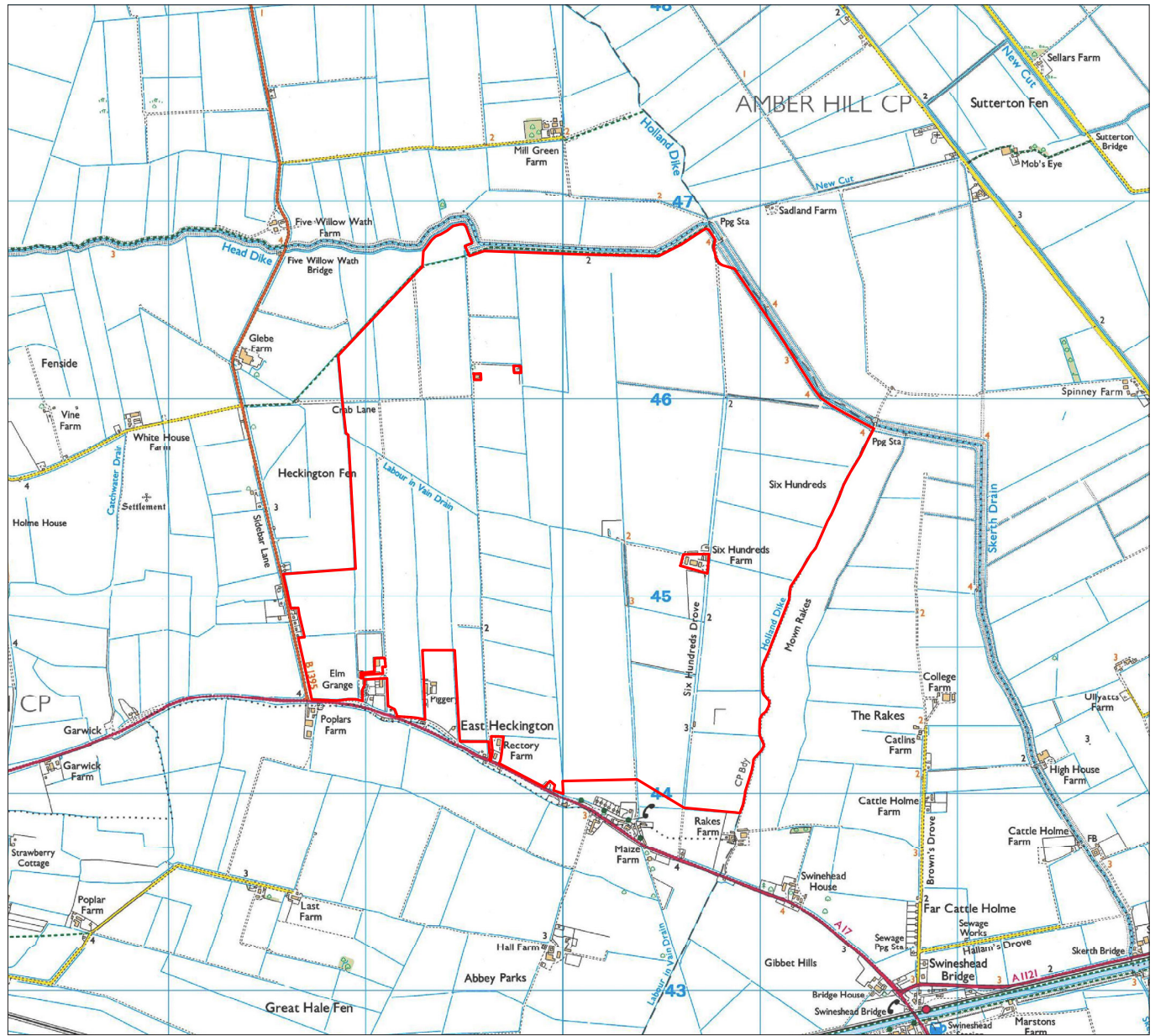


FIGURE 2: ENERGY PARK BOUNDARY
 AREA CONTAINING SOLAR PANELS, ENERGY STORAGE, ASSOCIATED INFRASTRUCTURE AND BIODIVERSITY NET GAIN

1.2 Overview of the Proposed Development

The Proposed Development includes the following key components:

- Solar PV panels;
- PV module mounting structures;
- Inverters;
- Transformers;
- Switchgear;
- Cabling (including high and low voltage) – mixture of above (on the energy park site only) and below ground (on the energy park site and the Grid Cable Route);
- One or more Battery Energy Storage Systems (BESS) (battery technology not determined at this time);
- Onsite substations including control buildings;
- Fencing and security measures;
- Internal access tracks;
- Community orchard;
- Permissive path;
- Construction of new access point onto highway (already consented);
- Landscaping including creation of new habitat areas;
- Construction of temporary construction areas and worker facilities;
- Digging of cable trench and laying cables for connection to the National Grid Bicker Fen Substation
- Installing above ground grid cable access points along the Grid Route; and
- Extension of Bicker Fen National Grid Substation and installation of above ground equipment.

Subject to obtaining the necessary consents, construction is anticipated to commence at the earliest in 2026, and to be completed ready for operation no earlier than 2027, with decommissioning no later than 40 years after the commencement of operation (assumed as 2067).

It is anticipated the Energy Park could create renewable energy to power 100,000 homes and would prevent 75,000 tonnes of carbon dioxide (CO₂) per year from entering the atmosphere. How these numbers are calculated can be found on <https://www.ecotricity.co.uk/our-green-energy/heckington-fen-solar-park>

1.3 The Applicant

Ecotricity (Heck Fen Solar) Limited, an Ecotricity company, has been formed to create and develop the Heckington Fen Energy Park.

Ecotricity was founded in 1995 as the world's first green energy company and now supplies customers across the UK from a growing portfolio of wind and sun parks, with all its electricity supply coming from 100% renewable energy. Ecotricity is a high technology business, developing cutting edge green technology and energy for a low carbon future.

1.4 The EIA Consultant Team

The team responsible for the production of the PEIR has been co-ordinated and managed by Pegasus Group. Pegasus Group is accredited under the Institute of Environmental Management and Assessment (IEMA) 'Quality Mark' scheme which is a mark of excellence in EIA co-ordination and management. Pegasus Group have extensive experience of undertaking EIA work across a range of projects and development types.

The consultants who have contributed to the preparation of this PEIR are set out in Table 1.1

TABLE 1.1: CONSULTANT TEAM

Topic	Consultant
EIA coordination and planning	Pegasus Group
Project Design and Buildability	Ecotricity
Landscape and Visual	Pegasus Group
Residential Amenity	Pegasus Group
Ecology and Ornithology	Ecotricity Kevin Shepherd- Consultant Ornithologist Neil Bostock- Consultant Ecologist
Hydrology, Hydrogeology, Flood Risk and Drainage	JBA Consulting
Cultural Heritage and Archaeology	Pegasus Group
Socio-Economic	Pegasus Group
Noise	Hoare Lea
Climate Change	Land Use Consultants (LUC)
Transport and Access	Pegasus Group
Air Quality	Hoare Lea
Land Use and Agriculture	Kernon Countryside Consultants Ltd Savills
Glint and Glare	Wardell Armstrong LLP
Miscellaneous Issues	Pegasus Group
Cumulative effects and inter-relationships	Assessment team

1.5 Purpose of the PEIR

The PEIR presents the preliminary findings of the EIA process in accordance with Regulation 12 of the The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended (hereafter referred to as the “EIA Regulations”). Regulation 12 requires an applicant to compile ‘preliminary environmental information’ that allows:

‘consultation bodies to develop an informed view of the likely significant environmental effects of the development (and of any associated development)’.

This PEIR provides details of the Proposed Development, together with an overview of the alternatives considered to date. For each environmental topic, details of the approach to assessment, the existing and likely future environmental conditions, and the preliminary findings regarding the likely significant effects of the Proposed Development are set out, based on the information available at this time. Initial details of the measures proposed to avoid, prevent, reduce or offset significant adverse effects (known as mitigation measures) are also provided.

The EIA process is currently ongoing, with further work being carried out to enhance the understanding of existing environmental conditions and to provide further detail of the likely significant environmental effects. Feedback provided during the consultation process will be considered in refining the design of the Proposed Development, during the ongoing assessment work and during the development of further mitigation measures where necessary. The results of this further work will be set out within the Environmental Statement (ES) that will accompany the application for Development Consent.

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

1.6 EIA Regulations and EIA Scoping

EIA is the process of identifying and assessing the significant effects (beneficial or adverse) likely to arise from a project. This requires consideration of the likely changes to the environment, where these arise as a consequence of a project, through comparison with the existing and projected future baseline conditions during/following the construction, operational and decommissioning phases of a development should it proceed.

For NSIPs in England, the legislative requirements for EIA are set by The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017, as amended (referred to in this report as the EIA Regulations).

EIA is not required for all developments. Schedule 1 of the EIA Regulations identifies development types that always require EIA. Schedule 2 identifies development types that require EIA if they are likely to lead to significant effects on the environment by virtue of factors such as their nature, size or location.

The Proposed Development would fall under Schedule 2, under Paragraph 3(a) of Schedule 2 of the EIA Regulations as it constitutes ‘industrial installations for the production of electricity, steam and hot water’. Taking into account the nature and scale of the development proposed, an EIA is being undertaken for the Proposed Development.

The Applicant has notified the Secretary of State in a letter to the Planning Inspectorate dated 7th January 2022 under Regulation 8(1)(b) of the EIA Regulations that an ES will be provided with the DCO application for the Proposed Development. Therefore, in accordance with Regulation 6(2)(a) of the EIA Regulations, the proposed development is an EIA development.

EIA METHODOLOGY

2.1 General Assessment Approach

The PEIR provides the preliminary findings of the environmental assessment undertaken to date. It does not constitute a draft Environmental Statement (ES); an ES will be produced to support the Development Consent Order (DCO) application, but the PEIR follows the same EIA methodology approach. The general assessment approach of the PEIR is in line with the EIA Regulations.

The EIA considers impacts during the construction, operation and decommissioning of the project. The content of the PEIR is based on the following:

- Review of the baseline situation through existing information, including data, reports, site surveys and desktop studies;
- Consideration of the relevant local, regional and national planning policies, guidelines and legislation relevant to the EIA such as the National Policy Statements (EN1, EN3 and EN5), Draft National Policy Statements (EN1, EN3 and EN5), National Planning Policy Framework (NPPF) and accompanying 'live' document National Planning Practice Guidance (NPPG), and the statutory extant and emerging development plan policies;
- Consideration of potential sensitive receptors;
- Identification of likely significant environmental effects and an evaluation of their duration and magnitude;
- Expert opinion;
- Modelling and calculations;
- Use of relevant technical and good practice guidance; and
- Specific consultations with appropriate bodies.

Individual environmental topic chapters are generally set out in the following way:

Executive Summary – short overview summarising the key effects of the chapter;

Introduction – to introduce the topic under consideration, state the purpose of undertaking the assessment and set out those aspects of the Proposed Development material to the topic assessment;

Assessment Approach – to describe the method and scope of the assessment undertaken and responses to consultation in relation to method and scope in each case pertinent to the topic under consideration;

Baseline Conditions – a description of the baseline conditions pertinent to the topic under consideration including baseline survey information;

Assessment of Likely Significant Effects – identifying the likely effects, evaluation of those effects and assessment of their significance, considering construction, operational and decommissioning phases and direct and indirect effects;

Mitigation and Enhancement – describing the mitigation strategies for the significant effects identified and noting any residual effects of the proposals;

Cumulative and In-combination Effects – consideration of potential cumulative and in-combination effects with those of other developments; and

Summary – a non-technical summary of the chapter, including baseline conditions, likely significant effects, mitigation and conclusion.

To enable comparison between technical topics and to aid understanding of the PEIR findings, standard terms are used wherever possible

to describe the relative significance of effects throughout the PEIR (i.e. 'major', 'moderate', 'minor' and 'negligible'). The effects are also described as being adverse or beneficial. Where the quality standards for each technical discipline result in deviations in the standard assessment methodology, these are described in the relevant chapters as applicable within PEIR Volume 1: Main Text and Figures.

Each of the technical chapters within the PEIR provides further description and definition of the significance criteria relevant to each topic. Where possible, this has been based upon quantitative and accepted criteria (for example, noise assessment guidelines), together with the use of value judgement and expert interpretation to establish to what extent an effect is significant.

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'. Where the EIA predicts a significant adverse effect on one or more receptors, proposed mitigation measures are identified to avoid or reduce the effect, or to reduce the likelihood of it happening. The use of such mitigation will be secured through the DCO, should it be granted.

As the design of the Proposed Development has evolved to date, the Applicant has worked with the environmental specialists to ensure the design avoids or reduces environmental effects on receptors where possible through the use of embedded mitigation by design measures (meaning measures that form part of the design or methods for construction or operation). These measures are taken into account in the EIA and assessment of the residual effects of the Proposed Development.

2.2 Cumulative Effects

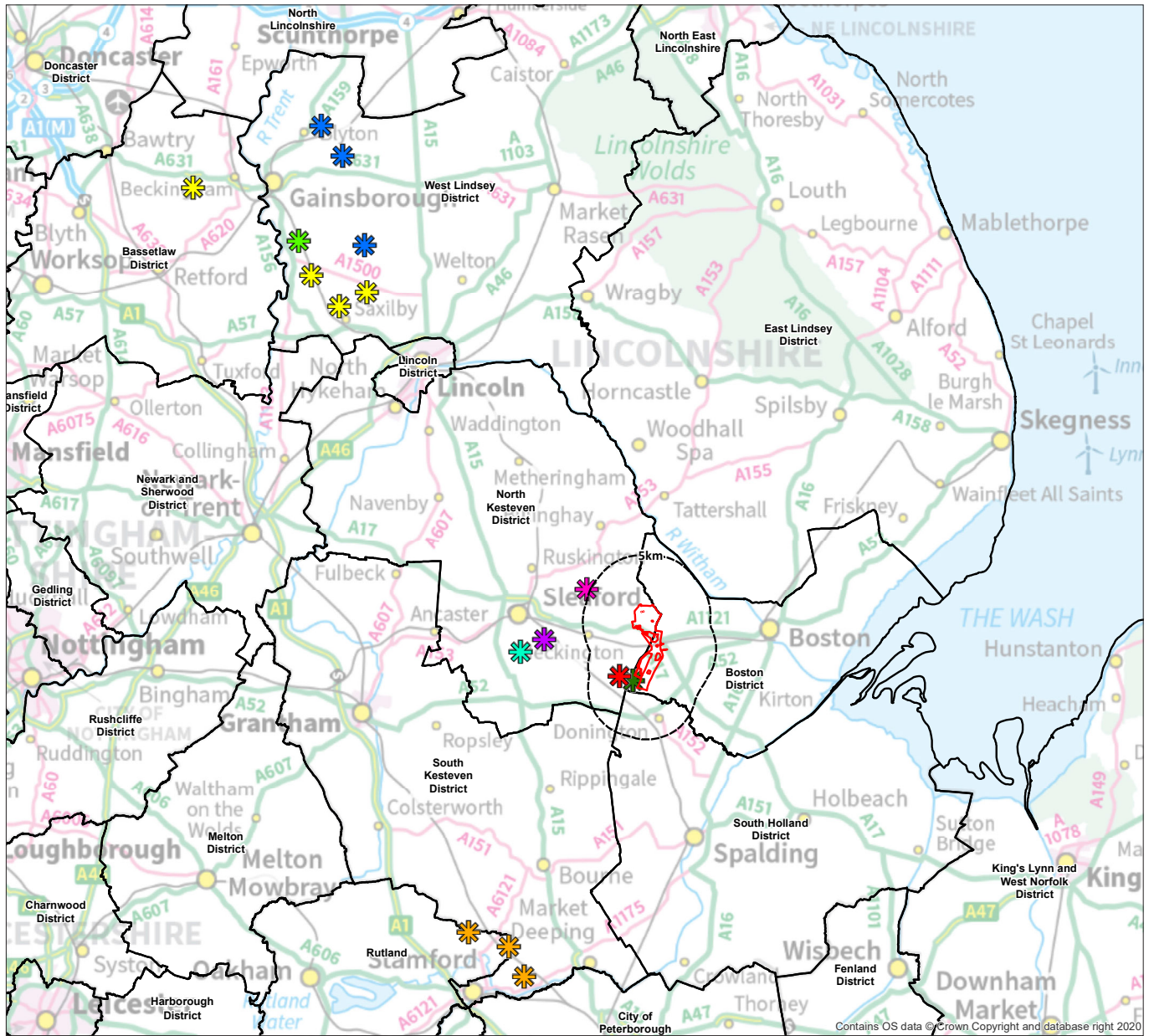
Within EIA, cumulative effects are generally considered to arise from the combination of effects from the Proposed Development and from other proposed or permitted schemes in the vicinity, acting together to generate elevated levels of effects. The cumulative effects assessment will consider two types of relationships:

- 1) Intra-project effects: combined effect of individual development – for example, noise, dust and visual on one particular assessment; and
- 2) Inter-relationship: several developments with insignificant impacts individually but which together represent a significant cumulative effect.

A short-list of cumulative developments and the methodology is considered in detail in Chapter 2- EIA Methodology of the PEIR. A long-list and short-list will be kept under review and if further planning applications are submitted or further information becomes available prior to the submission of the DCO Application, this will be considered within the ES.

The location of these cumulative sites in relation to the Proposed Development can be seen on **Figure 3 – Cumulative Solar Sites.**

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- KEY**
- Site Boundary
 - 5km buffer
 - Local Authority Boundary
 - ★ Cottam Solar Project (Cottam 1,2 & 3)
 - ★ Land at Ewerby Thorpe - Screening 14/1034/EIASCR
 - ★ Gate Burton Energy Park
 - ★ Land South Of Gorse Lane Silk Willoughby Approved - 19/0060/FUL
 - ★ Land at Little Hale Fen - Screening 21/1337/EIASCR
 - ★ Mallard Pass Solar Farm
 - ★ West Burton Solar Project (Sites 1,2,3 & 4)
 - ★ Land to the North of White Cross Lane - Approved 19/0863/FUL
 - ★ Vicarage Drove [B/21/0443]

FIGURE 3: CUMULATIVE SITES

SITE DESCRIPTION, SITE SELECTION AND ITERATIVE DESIGN PROCESS

This section of the NTS includes the following sections:

- Site Description- a description of the existing conditions within the Proposed Development and the surrounding areas and the key receptors that will be assessed in detail within the technical topic chapters;
- Site Selection- an overview of the site selection process undertaken for the Proposed Development; and
- Iterative Design Process- a description of the iterative design process undertaken and a description of the main alternatives to the Proposed Development and the selection of the Energy Park as the preferred option.

3.1 Site Description

3.1.1 Energy Park

The Energy Park is located on an area of greenfield land within East Heckington, approximately 3.7km east of the village of Heckington and 8.9km west of the town of Boston, Lincolnshire. The closest major city is Lincoln approximately 32km north-west of the Site. The village of Heckington is separated from the Site by agricultural land within the surrounding fenland landscape. The Energy Park extends to approximately 586 hectares (ha). The Energy Park site lies wholly within the administrative district of North Kesteven, abutting Boston Borough Council administrative boundary along the eastern edge of the Site. The grid route connection predominately lies within Boston Borough Council, with a small section in North Kesteven closest to the proposed site entrance.

The Energy Park comprises arable, agricultural land subdivided into rectilinear parcels by long linear drainage ditches that lie principally north-south, connected east-west by shorter ditches

including Labour in Vain Drain. The ditches have an engineered profile, colonised in part by emerging aquatic plant species. The Energy Park is bounded by Head Dike to the north, a smaller watercourse to the east, the A17 Sleaford to Holbeach road to the south and B1395 Sidebar Lane and further agricultural land to the west.

Six Hundreds Farm lies in the eastern third of the Energy Park site, with vehicular access gained from Six Hundreds Drove via the A17. Vehicular access is also provided via two other points further west of the A17 frontage at Rectory Farm and at Elm Grange, with tracks connecting to Crab Lane toward the northwest corner of the Energy Park site, and then to Sidebar Lane. The access tracks follow ditch alignments.

The extent of the Energy Park boundary is shown in **Figure 2** of the NTS.

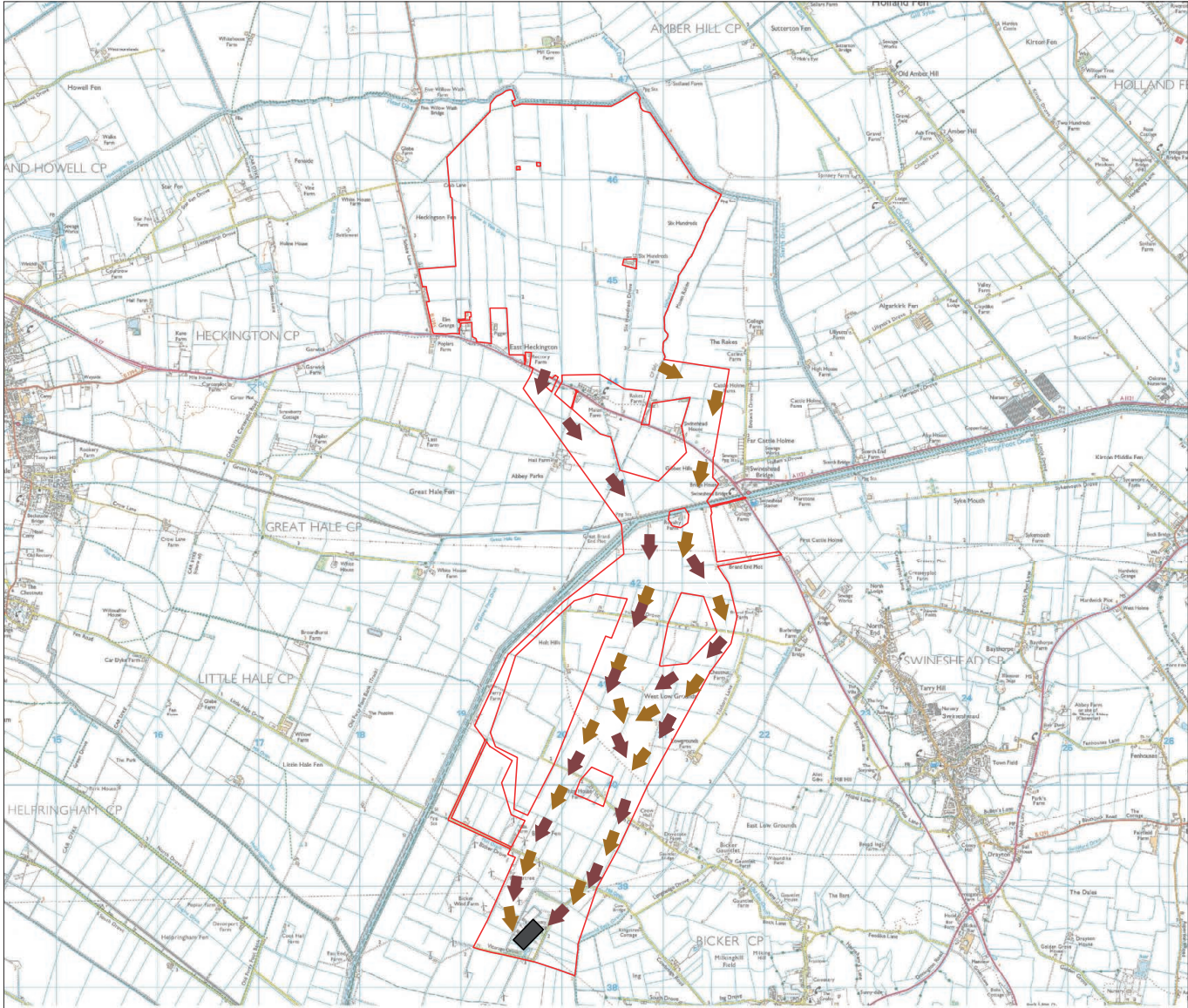
3.1.2 Cable Route Corridors and National Grid Bicker Fen Substation Extension





The electricity generated by the Proposed Development is to be imported and exported via underground cables from the onsite substations to the National Grid Bicker Fen Substation. An extension to the existing structures at Bicker Fen Substation will be required to accommodate the connection. Design work on the location of the cable route corridors for the grid connection is still in progress at the time of writing the PEIR; a final corridor route has not been determined. Two cable route corridor options are assessed within the PEIR and the indicative locations of the routes are presented within **Figure 4**:

- Grid Connection Route A- Eastern Route

The Eastern Route leaves the Energy Park on the eastern boundary, crossing the Viking Link and Triton Knoll connections before heading south towards Bicker Fen. Along the cable route crossings will be required for the A17, the South Forty Foot Drain, the railway, a high-pressure gas pipe and a number of watercourses.

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- KEY**
-  Bicker Fen Substation
 -  Site Boundary
 -  Option A
 -  Option B

These are the proposed routes under consideration for the underground grid cables. The final route is subject to legal agreement with the landowners, but will be within the Site Boundary.

Areas with no indicative cable route are included for access purposes

FIGURE 4: INDICATIVE GRID ROUTES

- Grid Connection Route B- 50-50 Route

The 50-50 Route (named as it covers elements of The Eastern Route, and a now discounted Western Route) leaves the Energy Park at the site entrance, on the eastern side of the high-pressure gas pipe. The cable would need to cross the A17 here, before crossing the Viking Link and Triton Knoll connections close to the South Forty Foot Drain and the railway. Once on the eastern side of the South Forty Foot Drain the route broadly follows a similar corridor to the substation, crossing the high-pressure gas pipe and a number of watercourses on the way to Bicker Fen Substation.

The location of the extension of Bicker Fen Substation has not been confirmed by National Grid, however ongoing discussions with them indicate the likely location of the extension will be on land to the immediate south-west of the existing substation. This area of land is currently an area of rough grassland, bounded by woodland.

3.1.3 Access

Access to the Energy Park will be gained via the A17. There is an existing access point which will be used for the initial stages of construction (creation of construction compound and materials for the new access point). This existing access point is on land adjacent to the Elm Grange Studios and the new Build-A-Future School.

It is intended that a new priority access point will be built shortly after the construction of the Proposed Development begins. This new priority access point will be used for the remainder of the construction phase and for the operational phase of the Energy Park. The new access point is also off the A17 and already has the principle of planning consent established, which was

achieved through the previously consented wind farm application.

3.1.4 Environmental Sensitivities within the vicinity of the Proposed Development

The Energy Park is bound by Head Dike to the north, a smaller watercourse to the east, the A17 Sleaford to Holbeach road to the south and B1395 Sidebar Lane/agricultural land to the west. In terms of landform, the Energy Park is very flat and low-lying at between 2m and 3m Above Ordnance Datum (AOD) across the entire area. The Energy Park is situated on the Lincolnshire Fens, a coastal plain in the east of England which comprises a large area of broad flat marshland supporting a rich biodiversity. The Energy Park falls within National Character Area 46- The Fens. There are no nationally designated landscape areas within North Kesteven. The North Kesteven Landscape Character Assessment (2007) identifies that the Energy Park Site is within "The Fens Regional Landscape Type" and the "Fenland Landscape Character Sub-Area".

Land within the Energy Park is in arable use and is subdivided into rectilinear parcels by long linear drainage ditches. The arable fields are generally used to grow wheat for compound animal feed with a smaller portion used to make a low biscuit grade grist. The previous break crop of harvest 2020 was oilseed rape. Agricultural land can be graded according to its inherent limitations for agricultural use. Grade 1 is excellent quality and Grade 5 is very poor quality. Grade 3 is divided into subgrades 3a "good" and 3b "moderate" quality land. Grades 1, 2 and 3a are defined as the "best and most versatile" land in the National Planning Policy Framework (2021). An Agricultural Land Classification Assessment (ALC) was undertaken in November 2021 across the Energy Park. The ALC results for the 525ha area proposed for the solar panel arrays within the Energy Park

(i.e. excluding the Potential Biodiversity Net Gain areas where soils are to be unaffected), show 50% of the site is Grade 3b land or below and therefore considered to be poorer quality land. The remaining 50% of the area for energy generation is a combination of Grade 3a (31%), Grade 2 (11%), Grade 1 (6%) and Non-Agricultural land (2%) which is considered Best and Most Versatile (BMV).

One public right of way (PRoW) footpath HECK/15/1 runs along the northern boundary, crossing a small part (c.280m) of the Energy Park; no other PRoW occurs within the Energy Park. The Proposed Development will not require the closure or diversion of HECK/15/1. It is proposed that an additional permissive path (4.2km) will be linked to HECK/15/1 to effectively create a loop walk around part of the Energy Park.

There are no European statutory designated sites (Ramsar, Special Areas of Conservation (SAC) & Special Protection Areas (SPA) or national sites Site of Special Scientific Interest (SSSI), National Nature Reserve (NNR), Local Nature Reserve (LNR) within 10km of the Proposed Development.

The nearest SSSI is Horbling Fen SSSI located 11.5km to the southwest of the Proposed Development, designated for its geological interest. The Wash SSSI/SPA/SAC/Ramsar and NNR, is situated approximately 17km to the southeast of the Proposed Development at its nearest point.

There are no non-statutory designations within the Energy Park. The South Forty Foot Drain Local Wildlife Site (LWS) is located approximately 1km to the south of the Energy Park Site. This is a man-made watercourse with bankside vegetation comprising rough neutral grassland, scrub, and trees. Cole's Lane Ponds LWS is located 6km southeast of the Site, and Heckington Grassland Site of Nature Conservation Interest (SNCI) is located approximately 5km to the west of the Energy Park.

The Energy Park includes a pond surrounded by bankside trees and scrub. There is an area of wet grassland to the west and north of the pond. There are a small number of hedgerows within the Energy Park which are used by a variety of breeding and over-wintering birds. Field boundary hedgerows are generally species-poor although the hedgerows vary in height, length, condition and management. Approximately 10.5ha of the Energy Park site is currently held under agri-environmental schemes, in the form of enhanced headlands by way of buffer strips.

There are no designated archaeological remains, e.g. Scheduled Monuments, located within the Energy Park Site. One Scheduled Monument and four Grade II Listed Buildings lie within a 2km radius of the Energy Park. Known and potential non-designated built and archaeological remains located within the Energy Park Site comprise:

- Upstanding post-medieval/modern buildings of Six Hundreds Farm;
- Upstanding post-medieval/modern brick boundary wall to the west of Elm Grange;
- Upstanding remains of a post-medieval/modern drainage pump close to Head Dike to the north-east;
- Buried remains of a post-medieval duck decoy to the east;
- Buried remains of former outfarms and field boundaries in various locations, some but not all of which are shown on historic maps;
- Buried remains of a possible enclosure of uncertain origin to the west of centre; and
- Buried remains of a possible enclosure and circular and linear features of uncertain origin to the east.

The majority of the Energy Park site is within Flood Zone 3, with some sections of the Energy Park falling within Flood Zone 2 and Flood Zone 1.

The Proposed Development is located approximately 11.3km west of its nearest Air Quality Management Area (AQMA), 'Haven Bridge AQMA' which is located in Boston Borough Council's (BBC) administrative area and which has been declared for exceedances of the annual mean nitrogen dioxide (NO₂) air quality objective (AQO).

Figure 5 shows a plan of the surrounding environmental designations discussed above.

3.2 Site Selection

One of the biggest constraints which has to be considered when developing a renewable energy scheme is securing a viable point of connection to the electricity network. Securing a grid connection for a scheme of this size needs to be to the 400kV network, which remains constrained in terms of availability and a reasonable timescale for connection. A 400MW export and 250MW import connection has been accepted with National Grid at Bicker Fen Substation. A 400kV underground cable would be installed to connect the Energy Park to the Bicker Fen National Grid Substation. The total length of the underground cable run for Grid Connection Route A would be approximately 7km and for Grid Connection Route B approximately 7.7km.

An important consideration is selecting a site of suitable shape, orientation and size that can accommodate the Proposed Development. Large open fields without vegetated boundaries reduce the impact that small fields can have on the layout design. The Energy Park Site with a fairly flat gradient of only 1–3m over the entire area, and as one large space of connected fields is suitable for optimising solar energy output.

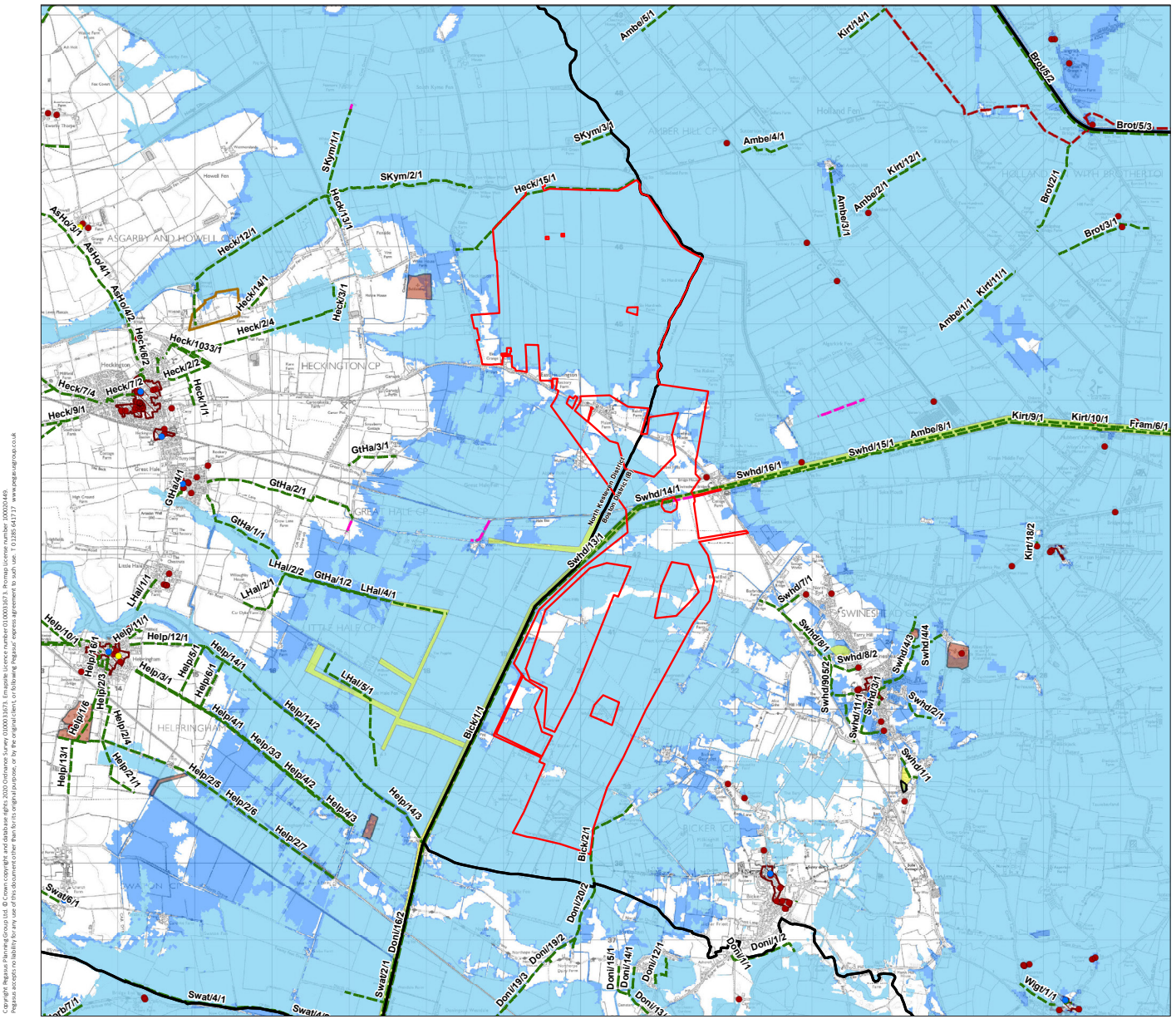
The nearest residential properties to the Energy Park Site boundary are along the A17 and the B1395 Sidebar Lane to the south and west respectively. The design of the Energy Park to date means considerable buffers have been made to ensure that no properties are in close proximity to solar panels, energy storage or electrical equipment. A majority of the properties are over 150m from the development.

The majority of the Energy Park is within Flood Zone 3, with some sections of the Energy Park falling within Flood Zone 2 and 1. Within Overarching National Policy Statement for Energy EN-1 (July 2011), section 5.8, the policy states that a Flood Risk Assessment (FRA) needs to accompany a proposed development within Flood Zone 2 or 3. Such an FRA will accompany the DCO Application.

The Applicant has had a relationship with the landowner of the Energy Park Site for a number of years due to a wind park proposal, which was approved in 2013. This has not become operational due to the development timescales of a technical radar solution which formed a 'Grampian Condition' on the wind park planning consent. The Applicant has an Option to Lease in place on the Energy Park Site, which will progress to a Lease once construction of the Energy Park commences.

3.3 Iterative Design Process

The layout of the Energy Park has evolved iteratively taking into consideration environmental effects, the planning and environmental policy objectives and Scheme functionality as well as feedback from stakeholders and non-statutory public consultation between October and December 2021. The iterative design process and alternatives considered are referenced in detail in Chapter 3– Site Description, Site Selection, and Iterative Design Process of the PEIR.



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Repaso Planning Group Ltd. 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000.



- KEY**
- Site Boundary
 - Local Authority Boundary
 - Grade I Listed Building
 - Grade II* Listed Building
 - Grade II Listed Building
 - Public Right of Way
 - Other Routes with Public Access
 - Open Access Land / Registered Common Land
 - Sustrans National Route
 - Scheduled Monument
 - Site of Nature Conservation Interest
 - Local Wildlife Site
 - EA Flood Zone 3
 - EA Flood Zone 2
 - Conservation Area

FIGURE 5: ENVIRONMENTAL DESIGNATIONS PLAN

PROPOSED DEVELOPMENT

The Proposed Development is defined under sections 14(1)(a) and 15(2) of the Planning Act 2008 as a Nationally Significant Infrastructure Project (NSIP), as it consists of construction of an onshore generating station in England exceeding 50 megawatts (MW). Associated development and other ancillary works are also proposed as part of the Proposed Development.

Indicative timescales for the construction and operation of the Proposed Development that have been assumed for the purpose of the assessment are as follows:

- It is currently anticipated that (subject to the necessary consents being granted) construction work will commence, at the earliest in the Spring of 2026 and will run for 18 months.
- It is currently anticipated that the earliest the Proposed Development will commence commercial operation is Autumn 2027. It is anticipated that sections of the Energy Park will commence their generation in stages, rather than await completion of the whole site before any renewable energy generation enters the National Grid; and
- The operational life of the Scheme is to be 40 years and decommissioning is therefore estimated to take place no earlier than 2067. Decommissioning is expected to take in the region of 6-12 months and will be undertaken in phases.

4.1 Need for the Proposed Development

The case for the need for the Proposed Development is centred on its significant contribution to the three important national energy policy aims, which are:

Decarbonisation – achieving Net Zero by 2050 and the importance of urgently deploying zero-carbon generation assets at scale – the Energy Park will provide a large-scale low carbon energy generating asset which is expected to be operational during 2027.

Security of supply – geographically and technologically diverse supplies – the Energy Park will provide the security of supply due to its large scale; direct connection to the National Electricity Transmission System, meaning the power that is generated has a national benefit; ability to complement other renewables and the efficient opportunity to integrate energy storage into the design of the Energy Park to help balance electricity needs over the wider Grid system.

Affordability – the Energy Park will provide large scale generation at low cost which removes the market fluctuations from fossil fuel costs, which lead to energy prices rising for the end user.

The Energy Park will therefore be a critical part of the development of the UK's portfolio of large-scale solar generation required to decarbonise its energy supply and provide secure and affordable energy supplies.

4.2 Proposed Development's Components

An accompanying Indicative Site Layout with set parameters has been drafted and the EIA process will assess against **Figure 6**– Indicative Site Layout. As the environmental assessments progress this Indicative Site Layout may be amended to allow for mitigation through design in the Proposed Development. Therefore, the Indicative Site Layout within this PEIR may not be the one considered within the ES for the submitted DCO application.

4.2.1 Solar PV Infrastructure

At the time of writing the PEIR, both fixed solar PV panels and solar PV panels that track the sun are under consideration for this installation. **Figure 7** and **Figure 8** are illustrative figures to show the two solar PV technology types.

Individual solar PV modules (or can be known as panels) are typically 2-2.5m long and 1-1.5m wide and typically consist of a series of polycrystalline cells which make up each panel. Several panels can be installed in either the

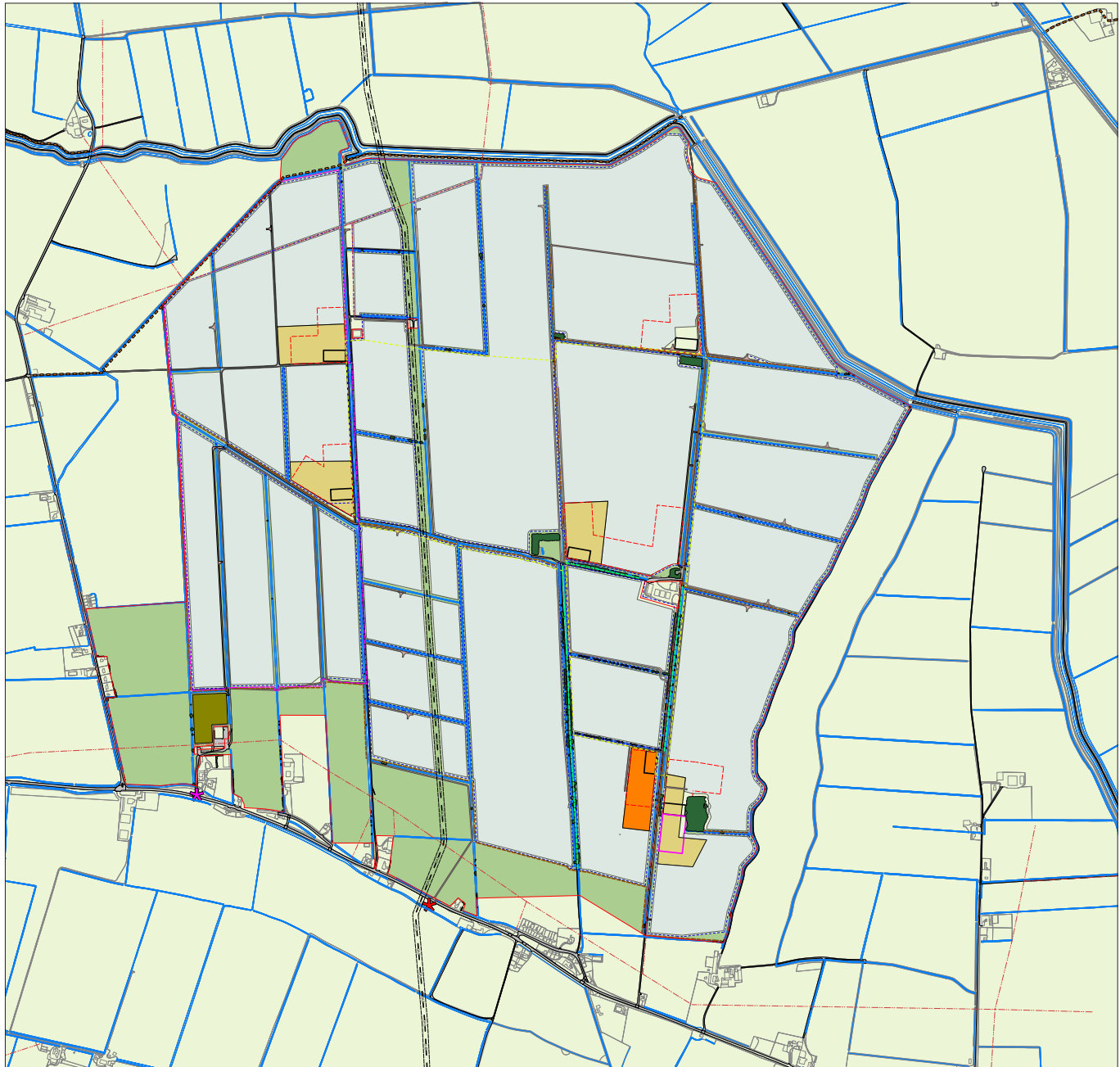


FIGURE 6: INDICATIVE SITE LAYOUT

- KEY**
- Site Boundary
 - Security Fence
 - ✱ Proposed Site Entrance
 - ✱ Temporary Access
 - Primary Access Track
 - Existing Road/Track
 - Solar Development Area
 - Public Right of Way
 - Proposed Permissive Footpath
 - Potential Biodiversity Net Gain (112.15ha)
 - Trees, Woodland and Hedgerows
 - New Hedgerow (10.19km)
 - Enhanced Hedgerow (1.98km)
 - Community Orchard
 - Ditch
 - Gas Pipeline
 - 11kV Overhead Line
 - Construction Compound
 - Primary Energy Storage
 - Indicative 400kV Substation Location
 - Indicative 132kV Substation Location
 - 132kV Substation and Energy Storage Zone
 - Indicative 132kV Overhead Cable Route

Buffers to development:
 - 9m to BSIDB maintained open watercourses
 - 5m to all other watercourses
 - 10m to gas pipeline
 - 5m to 11kV overhead line

Notes:
 Hedgerows would be up to 3m in width when mature and would be maintained up to 4m in height.

The Solar Development Area will include some localised electrical infrastructure such as inverters, transformers, energy storage and smaller substations.

Panel Angle Range: 10 degrees to 40 degrees. Shown as 20 degrees in drawing below.

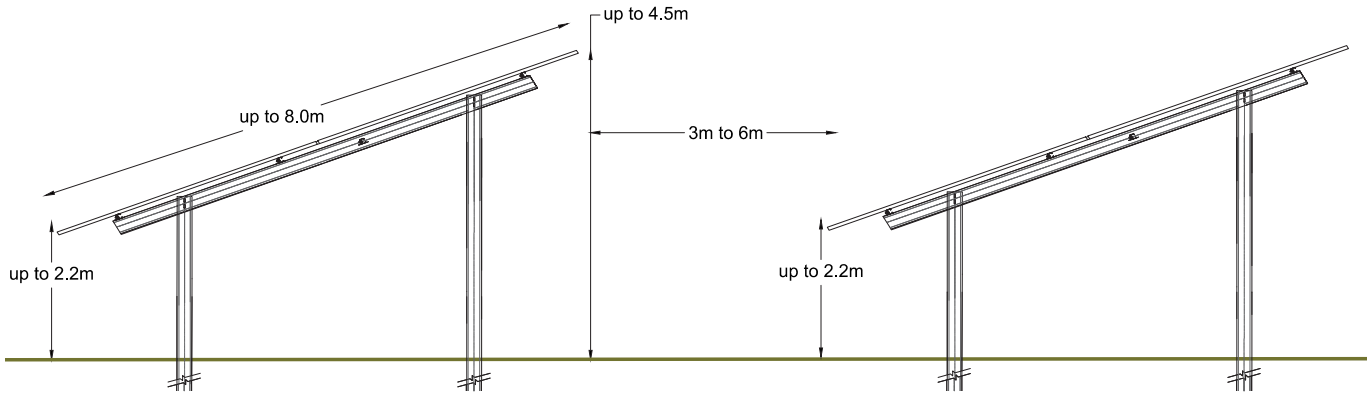


FIGURE 7: INDICATIVE FIXED MOUNTING SYSTEM OPTION

Maximum Tracking Angle: 60 degrees from horizontal. Shown as 45 degrees in drawing below.

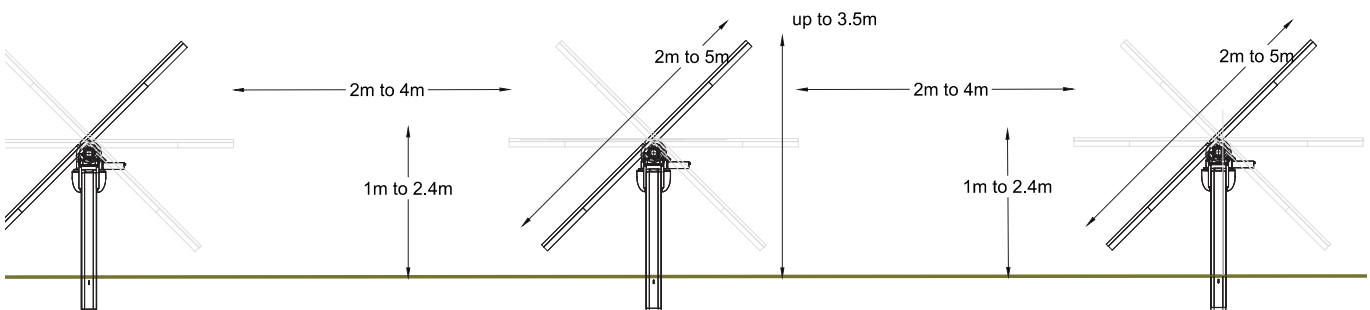
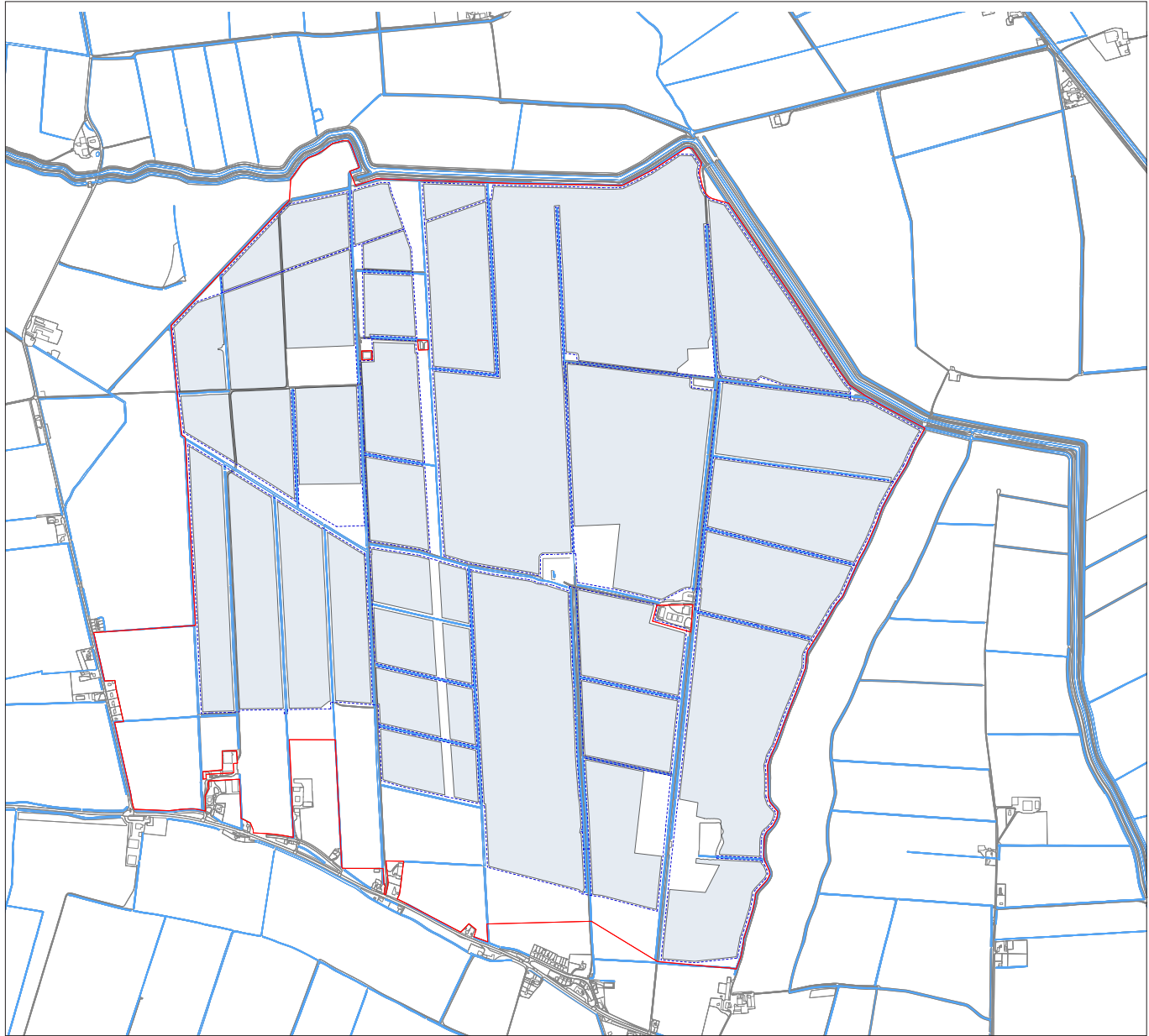


FIGURE 8: INDICATIVE TRACKING MOUNTING SYSTEM OPTION



KEY

- Site Boundary
- Security Fence
- Solar Development Area

Buffers to development:
 - 9m to BSIDB maintained open watercourses
 - 8m to all other watercourses
 - 10m to gas pipeline
 - 5m to 11kV overhead line

Notes:
 The Solar Development Area will include some localised electrical infrastructure such as inverters, transformers, energy storage and smaller substations.

FIGURE 9: SOLAR DEVELOPMENT AREA

landscape or portrait orientation on the racking. Each module could have a DC generating capacity of between 400–600watts (W), or more depending on advances in technology.

The modules are fixed into a mounting structure in groups known as “strings”. This mounting structure can be used for two different systems, a fixed panel system where the panels are fixed in one position and one angle, or a tracking system where the panel rotates on its axis to track the sun throughout the day. Each row of modules will be mounted on a rack supported by galvanised steel poles driven into the ground. Various mounting structures are available however, driven poles are currently expected to be the most likely foundation solution. Between each string of panels there could be an average separation distance of approximately 3.5m to maximise generation and allow sufficient access for maintenance. The spacing between racks of fixed and tracker panels varies, with a minimum of 2m for fixed and 3m for trackers. This spacing can increase to 4m and 6m respectively.

The assessments within the PEIR have assumed that the panel modules are mounted on structures with a clearance of a maximum of 2.2m and an upper height of a maximum of 4.5m. This upper height is subject to ongoing modelling for flood heights on the Energy Park Site and may be reduced for the assessments when the ES supporting the DCO application is submitted. Typical panel heights are 1–1.5m at the lower edge. The trackers would pivot with a potential lowest lead edge of 0.1m and highest edge of 3.5m.

Figure 9 details the solar infrastructure arrangement.

4.2.2 Inverters, Transformers and Switchgear

Inverters are required to convert DC electricity generated by the PV modules into alternating current (AC) which allows the electricity to be

exported to the National Grid. Inverters are sized to deal with the level of voltage which is output from the strings of PV modules.

Transformers are required to control the voltage of the electricity generated across the Energy Park Development site and efficiently transmit the power to the Development substation. A main 400kV step-down transformer will be required alongside smaller transformers. To ensure a worst-case scenario is assessed six 132kV transformers are proposed across the Energy Park site.

Switchgears are the combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment. Switchgears are proposed across the Energy Park, likely within the compounds for the 132kV substations.

4.2.3 Energy Storage

An energy storage facility will be an associated part of the electrical infrastructure of this Proposed Development. The primary energy storage area is proposed to be located in the south eastern section of the Site, either in a series of individual containers or housed within a larger building(s). There is the potential for further energy storage area to be located near to the 132kV substations which are located across the Energy Park. It is estimated at this time that the storage capacity would be approximately 200–400MW. The energy storage system which will include batteries, inverters and system controllers but its final design has not yet been determined.

4.2.4 Onsite Cabling

Within the PEIR, the assessment will consider a mixture of below ground and above ground cabling for the Energy Site. Any above ground cabling will be attached to poles which would traverse the Site. The maximum height of these poles could be 30m. As the design of the Site

develops further it will be determined if any above ground cabling is required. All below ground cabling will be laid into trenches and then the soil will be re-laid. The cabling will run the energy from the solar panels to the nearest of the six onsite 132kV substations. These substations will step-up the electricity onto a 132kV circuit which will traverse the site – either above or below ground. The 132kV substations will connect to the main 400kV substation which will again step up the power. Cables will then leave the main substation (400kV) and run to Bicker Fen Substation.

4.2.5 Onsite Substations

There are proposed to be six onsite substations within the Energy Park Site. The smaller 132kV substations on the Energy Park Site are expected to offer greater electrical efficiencies for the scheme. The main 400kV substation will include a control building which will include office space and welfare facilities as well as operational monitoring and maintenance equipment.

Figure 10 details the energy storage requirements and associated infrastructure for the Proposed Development.

4.2.6 Fencing, Security and Lighting

A fence will enclose the operational areas of the Energy Park Site. The fence is likely to be a metal mesh fence of approximately 3m in height. Pole mounted closed circuit television (CCTV) system, which will face towards the Energy Park and away from any land outside will also be deployed around the perimeter of the Energy Park site. These cameras will be mounted on poles of 3.5m height located within the perimeter fence.

It is likely that lighting on sensors for security purposes will be deployed around the energy storage area and potentially at any other pieces of critical infrastructure. No areas of the

Development are proposed to be continuously lit during the operational phase of this development.

Figure 11 details the proposed assets within the Energy Park.

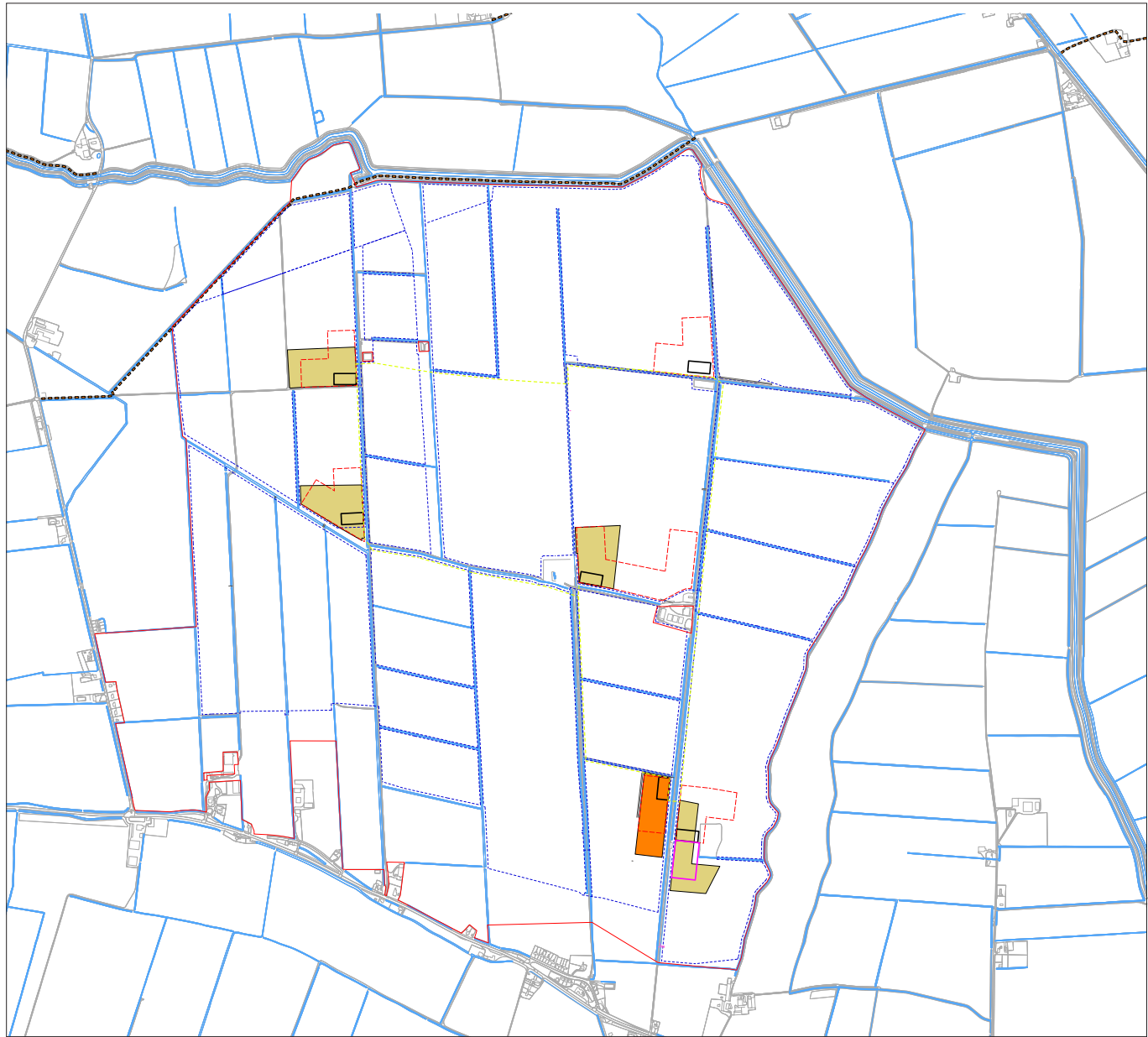
4.2.7 Site Access and Access Tracks

Currently there are a number of access points into the Site from the A17. It is proposed to use the existing access point near Elm Grange for the very initial stages of construction. The eventual new point of access for operation and remaining stages of the construction process is also on the southern boundary and would form a new access point off the A17. The new operational point of access is a previously approved point of access that was not built out as it is linked to the approved wind farm application.

Once on site the access track will continue northwards and minor internal access tracks will be connected to it. These minor access tracks will connect into each parcel of the development. These primary access tracks that traverse the Site will likely be made of crushed aggregate or other suitable reinforcement.

Figure 12 details the proposed access arrangements within the Energy Park.

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- KEY**
-  Site Boundary
 -  Security Fence
 -  Construction Compound
 -  Primary Energy Storage
 -  Indicative 400kV Substation Location
 -  Indicative 132kV Substation Location
 -  132kV Substation and Energy Storage Zone
 -  Indicative 132kV Overhead Cable Route

FIGURE 10: PROPOSED ENERGY STORAGE

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

- KEY**
-  Site Boundary
 -  Current Point of Access
 -  Existing Road/Track
 -  Public Right of Way (HECK/15/1)
 -  Ditch
 -  Gas Pipeline
 -  11kV Overhead Line

FIGURE 11: ASSETS

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- KEY**
-  Site Boundary
 -  Proposed Site Entrance
 -  Temporary Access
 -  Primary Access Track
 -  Existing Road/Track

FIGURE 12: SITE ACCESS

4.2.8 Offsite cabling

Design work on the location of the cable route corridors for the grid connection is still in progress at the time of writing the PEIR; a final corridor route has not been determined. Two cable route corridor options are assessed within the PEIR; Grid Connection Route A- Eastern Route and Grid Connection Route B- 50-50 Route. At certain points along the route, it will be necessary to drill past 'obstacles' such as roads, watercourses, and other utilities. The cable routes are still being surveyed and so more detail on the extents and precise locations of the cable routes will be finalised in the ES supporting the DCO application.

4.2.9 Bicker Fen Substation Extension Works

The electricity generated is expected to be exported via a connection from the Site to the existing National Grid Electricity Transmission (NGET) 400kV Bicker Fen Substation. This will require an extension to the existing structures at Bicker Fen Substation. The choice of the location for the extension will be determined by National Grid, but is expected to be to the south-west corner.

4.2.10 Construction Phase

It is currently anticipated that (subject to the necessary consents being granted) construction work will commence, at the earliest in the Spring of 2026 and will run for 18 months.

The types of construction activities that may be required include (but are not limited to):

- Importing of construction materials;
- Culverting some ditches on the Site – anticipated to only be at the site entrance;
- The establishment of the construction compound(s) – this will likely move over the course of the construction process as each phase is built out, a maximum of 4 are proposed and their proposed

locations can be seen on Figure 2.1

Indicative Site Layout;

- Creation of a new access point for the Site (A17);
- Installing the security fencing around the Site;
- Importing the PV panels and the energy storage equipment;
- Erection of PV frames and modules;
- Laying of overhead cables onsite and digging cable trenches and laying cables onsite;
- Installing transformer cabins;
- Construction of onsite electrical infrastructure for the export of generated electricity
- New habitat creation;
- Creation of the permissive path;
- Digging of cable trench and laying cables for connection to the National Grid Bicker Fen Substation;
- Installing above ground grid cable access points along the Grid Route; and
- Installing new technical equipment at the National Grid Bicker Fen Substation.

A main temporary construction compound will likely be established close to the Development site entrance. Smaller temporary compounds will be located across the Development as the site is built out in its various phases, currently proposed to be four. The construction process will take place as one continuous process, so when Phase 1 is completed, Phase 2 would start.

An Outline Construction Traffic Management Plan (CTMP) will be developed as part of the EIA which will guide the delivery of materials and staff onto the Proposed Development Site during the construction phase. The principles of the draft Outline CTMP will be available for comment as part of the consultation process

to ensure that the comments of local residents and stakeholders are taken into account in its development (Appendix 14.1).

It is envisaged that a Outline Construction Environmental Management Plan (CEMP) will be secured by requirement in the DCO which will include measures to minimise environmental effects during construction works and will be submitted with the DCO application.

An Outline Soil Management Plan will be submitted as part of the DCO application. This document has been requested by Natural England and will set out the proposals for how the soil will be managed through the construction process to ensure that its structure and quality are maintained.

4.1.11 Operational Phase

It is currently anticipated that the earliest the Proposed Development will commence commercial operation is Autumn 2027. During operation of the Development, human activity on the Site will be minimal and would be restricted principally to vegetation management, equipment maintenance and servicing, replacement of any components that fail, monitoring to ensure the continued effective operation of the Development and the shepherd gaining access to the Site for manage the low intensity flock. It is anticipated that the operation of the Energy Park will create five full time jobs. HGV movements are not expected unless replacement equipment is required on at the Energy Park as part of the maintenance programme.

There is a proposed 'Community Orchard' as part of the ecological enhancements of the Energy Park. At this time, it is hoped that students of the new school at Elm Grange, as well as other community groups, would be able to access this orchard. The access arrangements to such a community asset

are still to be finalised, but will be discussed over the formal consultation process for this proposal.

4.2.12 Decommissioning Phase

The Development will be decommissioned at the end of its approved operational phase. All PV modules, mounting poles, cabling above 1m below ground (on and off site) (any cabling buried 1m+ below ground will not be removed at decommissioning), substations, energy storage equipment, inverters, transformers etc would be removed from the Development. These items would be recycled or disposed of in accordance with good practice and market conditions at the time. A Decommissioning Plan, to include timescales (expected to take 6-12 months) and transportation methods would be agreed in advance with the Local Planning Authority. As requested in the Scoping Opinion an outline Decommissioning Scheme will accompany the DCO application.

It is the intention that after the 40 years of operation the whole of the Energy Park Site will revert to its current use and be used by the landowner for agricultural operations of their choice and determined by the global markets at that time. This will include the areas that will have been used for biological diversification over the lifetime of the Energy Park. It is the intent that the permissive path would also be closed to public once the Energy Park is decommissioned.

At this time the applicant has been advised by National Grid that the additional electrical infrastructure that will be installed at the National Grid Bicker Fen Substation for the Development may remain in place, rather than being decommissioned. Further clarity on this will be provided in the ES.

FINDINGS OF THE PEIR

5.1 Topics Assessed

Chapter 1 to 5 of PEIR Volume 1: Main Text and Figures provides an introduction to the Proposed Development, approach and methodology to the EIA, description of the DCO Site and surrounds, an overview of the Proposed Development and alternatives that were considered during the design process, and the policy and legislative context.

The following topic specific chapters have been produced and assessed in the PEIR Volume 1: Main Text and Figures–

- Chapter 6 Landscape and Visual
- Chapter 7 Residential Amenity
- Chapter 8 Ecology and Ornithology
- Chapter 9 Hydrology, Hydrogeology, Flood Risk and Drainage
- Chapter 10 Cultural Heritage
- Chapter 11 Socio-Economic
- Chapter 12 Noise and Vibration
- Chapter 13 Climate Change
- Chapter 14 Transport and Access
- Chapter 15 Air Quality
- Chapter 16 Land Use and Agriculture
- Chapter 17 Glint and Glare

Miscellaneous Issues with the PEIR Volume 1– Chapter 18 provides an overview of the topics that can be addressed more concisely than the other topic specific chapters and therefore do not merit an individual chapter. These topics include major accidents and disasters; telecommunications, television reception, utilities; and waste.

An assessment of the environmental effects of the Proposed Development during its construction, operation (including maintenance) and eventual decommissioning has been completed for each of the topics. The likely significant environmental effects of the Proposed Development are fully described within the PEIR Volume I: Main Text and Figures. The following environmental topic sections provides a brief summary of the overall findings of the PEIR.

LANDSCAPE AND VISUAL

The Landscape and Visual PEIR Chapter contains a preliminary assessment of the potential effects upon the landscape elements associated with the Energy Park Site, landscape character and visual amenity brought about by the Proposed Development. In line with best practice and requirements of National Policy Statements EN-1 and EN-3 it considers the effects during the construction, operation, and decommissioning stages. It does not describe the residual magnitude of change or predicted residual effects, but rather provides a summary table detailed in Chapter 6, which outlines the predicted residual effects. Detailed assessment will be provided in Chapter 6 of the ES.

The Proposed Development encompasses the Energy Park, off site cable route and above ground works at the National Grid Bicker Fen Substation. The Energy Park, comprises solar modules infrastructure, onsite cabling, energy storage infrastructure and associated infrastructure, located to the north of the A17. This PEIR Chapter 6 considers the Proposed Development in terms of its maximum parameters: the extent and height of the solar modules, substation elements, overhead power cables, and fencing, as described within PEIR Chapter 4. The typology and height parameters of the proposed solar modules, and exact design of the substation elements have not yet been finalised and will be confirmed in the Environmental Statement.

The PEIR Chapter 6 also sets out the main policies and guidance relevant to landscape and visual matters based on the Overarching National Policy Statement for Energy (EN-1) and National Policy Statement for Renewable Energy Infrastructure (EN 3) and their current drafts. In addition, policies provided in the National Planning Policy Framework (NPPF) and Planning Practice Guidance (PPG) have also been reviewed to inform the approach and

assessment work. The provided assessment is based on established best practice methodologies.

6.1 Baseline Conditions

The Proposed Development is not located within any national statutory protected landscape designations. It does not lie within any regional or local non-statutory landscape designations, either.

The Application Site falls within National Character Area 46 The Fens.

The North Kesteven Landscape Character Assessment, prepared by David Tyldesley and Associates for North Kesteven District Council, identifies that the Energy Park Site falls within The Fens Regional Landscape Character Type in the east of the district, and the Fenland Landscape Character Sub-Area.

The grid connection area primarily falls within Boston Borough Council's area and is covered by its own Landscape Character Assessment of Boston (2009). This published assessment identifies that the grid connection falls entirely within the Landscape Type (LT) A Reclaimed Fen and more specifically its Landscape Character Area (LCA) A1 Holland Reclaimed Fen.

With regard to the visual receptors, based on the OS Explorer map 1:25,000 and site surveys it has been determined that the settlements of Heckington, East Heckington, Swineshead Bridge, and South Kyme are relevant to the assessment. Similarly, the site survey work has helped to determine that the A17 and Sidebar Lane / the B1395 are the only two transport corridors considered informative to this PEIR Chapter 6. In addition, the railway line between Heckington to the west and Boston to the east is the only railway line in the local area. The proposed cable route crosses the railway corridor, and thus has been included.

SUSTRANS Cycle Route No. 1, located to the north-east of the Energy Park approximately 3.9km away at its closest point, has been excluded from further assessment due to the distance and intervening vegetation.

In addition to Heck/15/1 which runs along the north western boundary, there are a number of Public Rights of Way (PRoWs) within the local landscape that have been identified as potentially offering close to medium range views, and being relevant to the Proposed Development:

- Public Footpaths Heck/1/1, Heck/2/1, Heck/2/2 and Heck/1033/1 on the eastern edge of Heckington.
- Public Footpaths Heck/3/1 and Heck/2/4 near Hall Farm and Littleworth Drove, connecting to Heckington, and forming part of the promoted Heckington Fen Walk.
- Public Footpaths Heck/13/1, SKym/2/1, and SKym/1/1 that cross the eastern part of Howell Fen, near Fenside and connect to Sidebar Lane and South Kyme.
- Public Footpath SKym/8/1 on the southern edge of South Kyme.
- Public Footpath Ambe/5/1 near Chestnut House Farm.
- Other Routes with Public Access coincide with Harrison's Drove in the southern part of Algarkirk Fen.
- Bicker Drove located near Public Bridleway Bick/1/1.

Based on the preliminary works and further desktop and field work a total of 19 no. of viewpoints have been selected and they include locations discussed with the Councils during the consultation process through the Scoping Report, and subsequent consultation with their landscape consultant and officers. The identified viewpoints are not intended

to cover every possible view of the Proposed Development, but rather they have been selected to be representative of a range of receptor types.

6.2 Assessment of potential for likely significant effects

Construction Phase

PEIR Chapter 6 has concluded that the construction of the Proposed Energy Park and associated grid connection to the existing 400kV Bicker Substation will bring about major and significant adverse effects upon the ground cover. With regard to the structural vegetation: trees and hedgerows within the Energy Park Site, the Proposed Development would not result in any significant adverse effects. The residual effects, following the implementation and establishment of the proposed mitigation planting is likely to result in beneficial significant effects upon the hedgerow resource. No other landscape elements or features associated with the Energy Park Site would be significantly affected by the Proposed Development during its construction phase.

In terms of landscape character, it has been assessed that the construction stage may result in temporary short term significant adverse effects upon the local landscape of The Fens Regional Landscape Character Type and the Fenland Landscape Character Sub-Area (identified in the published *North Kesteven Landscape Character Assessment*) and Landscape Type (LT) A Reclaimed Fen and its associated LCA A1 Holland Reclaimed Fen, (identified in the published *Landscape Character Assessment of Boston*).

With regard to the southern part of the Energy Park Site, south of the A17, there are a number of PRoWs that cross the grid connection area or abut its preliminary boundaries. Receptors associated with these routes are unlikely to be subject to any long-term significant effects.

The construction phase is also likely to bring about significant adverse effects upon the receptors associated with the settlement of East Heckington, and individual properties in Swineshead Bridge, located along Brown's Drove, and in Amber Hill. With regard the road users travelling along Sidebar Lane, significant adverse effects are like to occur due to the proximity to the proposed Energy Park and openness of the views. Users associated with the railway line are also likely to be subject to significant adverse effects brought about by the construction phase of the grid connection, south of the A17.

In terms of PRoWs, users along the following routes have been assessed as potentially subject to significant adverse effects during the construction phase of the Proposed Development:

- Public Footpath Heck/15/1.
- Public Footpath Swhd/14/1, Swineshead Bridge.
- Public Footpaths Heck/13/1, Skym/2/1, and Skym/1/1.
- Other Route with Public Access that coincides with Bicker Drove.

In terms of static receptors, the following viewpoints (see **Figure 13**) have been assessed as potentially experiencing significant adverse effects during the construction phase of the Proposed Development:

- Viewpoint 1.
- Viewpoint 2.
- Viewpoint 3.
- Viewpoint 4.
- Viewpoint 6.
- Viewpoint 8.
- Viewpoint 9.
- Viewpoint 14.
- Viewpoint 15.

Operational Phase

The Energy Park of the Proposed Development has been assessed as potentially causing geographically limited yet significant adverse effects upon the character of The Fens Regional Landscape Character Type and the associated Fenland Landscape Character Sub-Area (identified in the published North Kesteven Landscape Character Assessment).

No other landscape character receptors have been assessed as subject to significant adverse effects during the operational phase of the Proposed Development.

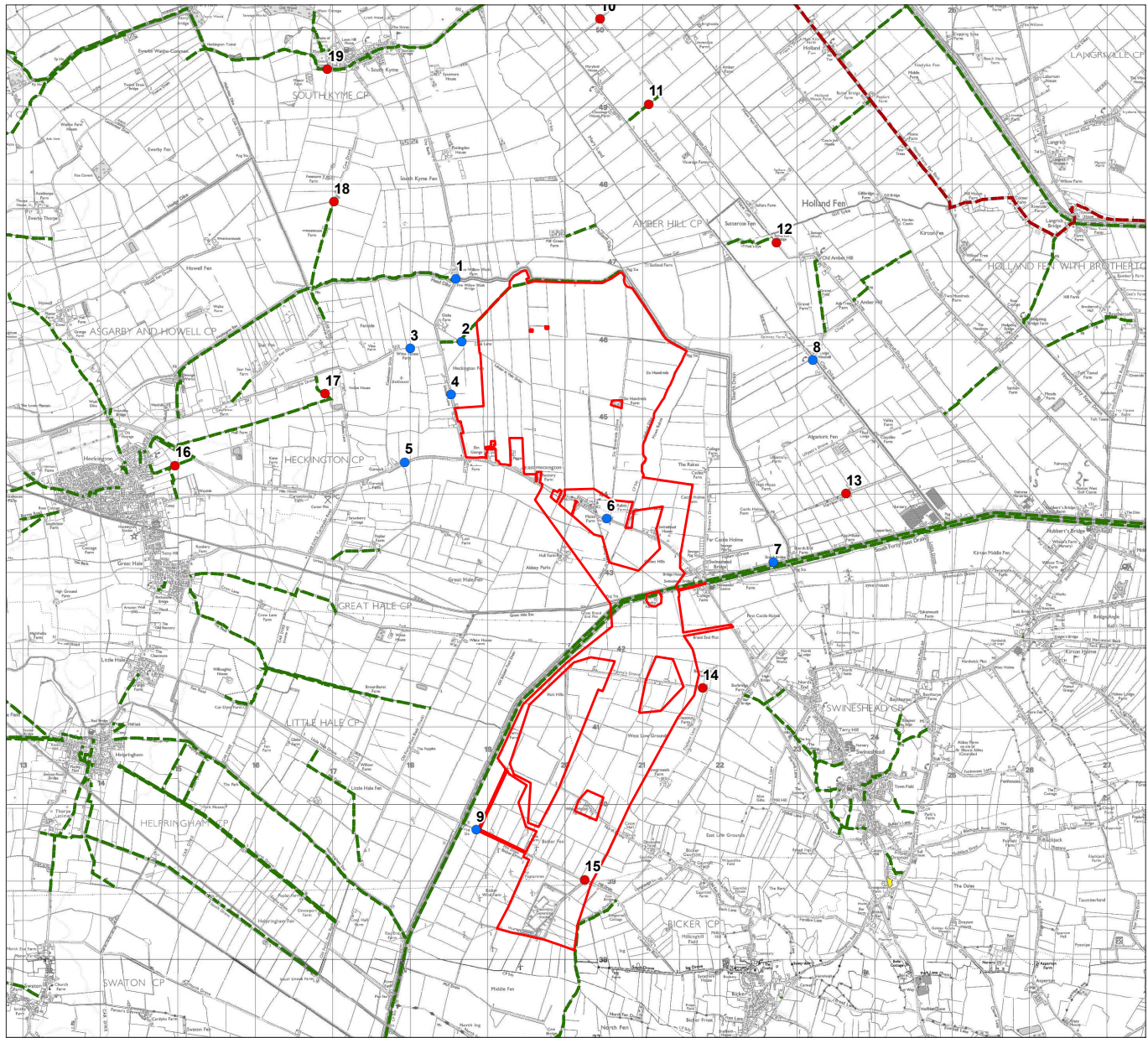
With regard to the visual receptors, the operational stage of the Proposed Development has been considered to bring about significant adverse effects upon the receptors within East Heckington, and specific residential receptors at Amber Hill.

Similarly, to the construction phase, road users travelling along the central and southern section of Sidebar Lane, will be subject to significant visual effects during the operational phase of the Proposed Development.

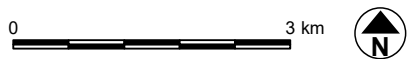
In terms of PRoWs, users along the following routes have been assessed as potentially subject to significant adverse effects during the operational phase of the Proposed Development:

- Public Footpath Heck/15/1.
- Public Footpaths Heck/13/1, Skym/2/1, and Skym/1/1.
- Public Footpath Ambe/5/1 near Chestnut House Farm

In terms of static receptors, the following viewpoints have been assessed as potentially experiencing significant adverse effects during the operational phase of the Proposed Development:



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KEY

- Site Boundary
- Sustrans National Route
- Public Right of Way
- Open Access Land / Registered Common Land
- Additional Viewpoints
- Proposed Viewpoint Location (Scoping report stage)

FIGURE 13: VISUAL RECEPTORS AND VIEWPOINT LOCATIONS

- Viewpoint 1.
- Viewpoint 2.
- Viewpoint 3.
- Viewpoint 4.
- Viewpoint 6.
- Viewpoint 8.

No other visual receptors have been assessed as experiencing significant adverse effects during the operational phase of the Proposed Development.

Figure 14 and **Figure 15** are photomontages (stitched photographs aligned with a completed 3D model of the rendered Proposed Development infrastructure) presenting an interpretation of what the Proposed Development could look like. To note, the photomontages are indicative and used for illustrative purposes only and, whilst useful tools in the assessment, are not considered to be completely representative of what will be apparent to the human eye.

6.3 Mitigation and Enhancement

At this stage the proposed mitigation measures constitute designed-in mitigation measures such as reduction in the extent of the proposed solar modules and refinements to the layout to provide physical separation from nearby residential and commercial properties.

The existing landscape elements and features within the Energy Park Site have been considered with offsets from internal and boundary watercourses and vegetation proposed to safeguard these features and to ensure continued maintenance access.

During the preliminary design, the proposed 400kV substation compound and energy storage area have been located within the south-eastern corner of the Energy Park to

maximise visual screening provided by the existing blocks of woodland and tree lines. Further landscape and visual assessment work will determine the appropriateness of such layout.

Existing hedgerows and lines of trees within the Energy Park would be protected and enhanced with gapping-up using appropriate species. New hedgerows would be established along the southern and western edges of the solar modules, and within the Energy Park. Further design options for mitigation measures, and species selection, are currently being considered.

As part of the Proposed Development a new community orchard is being proposed in the south western corner of the Energy Park. This would be located immediately to the north of the new school at Elm Grange.

6.4 Conclusion

It is important to acknowledge that significant effects on landscape character and visual amenity are an inherent consequence of a new development of this type and scale. However, in this case, any potential for adverse effects have been judged to be limited by the existing vegetation that characterises the close to medium range landscape. The proposed mitigation planting has the potential to considerably reduce such significant effects, which would be geographically highly limited, both in character and visual terms. Whilst certain elements of the Proposed Development would, inevitably, be more visible, for a scheme of its scale the residual landscape and visual effects arising are considered to be highly limited. Those effects which have been identified as being significant should therefore be balanced against the benefits of the Proposed Development.



FIGURE 14: PHOTOMONTAGE - VIEWPOINT 6 YEAR 10



FIGURE 15: PHOTOMONTAGE - VIEWPOINT 8 YEAR 10



Key

- 400kV Substation
- 132kV Substation
- Energy Storage
- Solar Panels



Parameters

- Solar Panel Areas - height 4.5m
- 132KV substations - height 10m
- 400kv substation - height 15m
- Battery storage unit - height 6m

RESIDENTIAL AMENITY

This Residential Visual Amenity Assessment (RVAA) has been prepared as part of the PEIR Chapter 7 and seeks to determine the preliminary visual effects upon the identified residential receptors and whether or not the Energy Park would result in unacceptable consequences to living conditions such that consent should be refused in the public interest. Only the Energy Park has been assessed and not the entire Proposed Development (Energy Park, grid cable route corridors and extension work at Bicker Fen Substation).

7.1 Baseline Conditions

The scope and study area of the residential properties included within this RVAA has been informed by the findings of the PEIR Chapter 6: LVIA, site surveys, the Zone of Theoretical Visibility (ZTV) mapping, post code data and consultation undertaken through the Scoping Report. Only the operational phase has been considered in the PEIR; the construction and decommissioning stage will be detailed in the ES supporting the DCO application.

Given the type and scale of the Energy Park and the dispersed nature of the surrounding residential properties, the likelihood of any significant visual effects is considered to be restricted to those within the immediate surroundings of the site.

7.2 Assessment of potential for likely significant effects

The findings of this PEIR Chapter 7: RVAA demonstrate that the Energy Park would cause some localised significant visual effects, but such effects would not be overbearing in the operation phase. It is predicted that the construction and decommissioning stage will bring about similar or lower magnitude of change, and similar effects to those assessed during the operational stage of the Energy Park.

None of the predicted effects occurring during the construction and decommissioning stage are likely to be overbearing or overwhelming.

7.3 Mitigation and Enhancement

Mitigation planting will be proposed in areas where there would be localised visual effects. In general terms, the magnitude of change on the residential properties will decrease with distance from the Energy Park and will reduce further once the proposed mitigation planting has established.

7.4 Conclusion

The findings of this PEIR Chapter 7: RVAA demonstrate that the Energy Park would cause some localised significant visual effects but such effects would not be overbearing. The analysed properties and predicted effects are outlined in Table 7.2 of Chapter 6.

ECOLOGY AND ORNITHOLOGY

The PEIR Chapter has, where surveys have been completed, identified and assessed the potential impacts effects of the proposed development of a 586.85ha Energy Park and off-site grid connection cable route and above grounds works at the National Grid Bicker Fen Substation on ecology and nature conservation value during construction, operation, and decommissioning.

An extended Phase 1 survey, badger surveys, breeding and wintering bird surveys have been completed on the Energy Park site. Wintering bird surveys have been completed on the off-site grid connection cable route and above grounds works at the National Grid Bicker Fen Substation. There are ongoing surveys for great crested newt, bats, aquatic plants and rare arable plants on the Energy Park site. Surveys for breeding birds, badger, great crested newts, rare arable plants and aquatic plants and an extended Phase 1 survey are currently being carried out along the proposed off-site grid connection cable route and above grounds works at the National Grid Bicker Fen Substation.

The PEIR Chapter provides an assessment of the potential direct and indirect effects on nature conservation designations, important habitats, protected species onsite and offsite. It considers avoidance design measures, mitigation, compensation and management activities to minimise any potential effects.

8.1 Baseline Conditions

The Energy Park and associated off-site Grid Connection will be situated within an intensively farmed landscape of low nature conservation value. The substation extension is within the National Grid land boundary, alongside the existing Bicker Fen Substation. The large fields associated with the remainder of the Proposed Development are divided by wet ditches and Internal Drainage Board managed water courses.

There are no sites of international, national or local importance within or adjacent to the Energy Park Site. There is one Local Wildlife Site (The South Forty Foot Drain) along the route of the off-site grid connection. The Wash SPA is approximately 16km from the Proposed Development. The data searches did not reveal the presence of any protected species within the Energy Park. There are records of otter from the South Forty Foot Drain and records of Water Vole within the last 5 years in the Great Hale Eau LWS.

Figure 16 shows the Statutory and Non-Statutory Sites and Protected and Notable Species within 10km

There are a limited number of gappy hedgerows on the Energy Park Site, and a small number trees mainly restricted to plantation woodlands. The wet drainage ditches provide suitable habitats for Water Vole and Otter but no evidence of their use by these species was found on the Energy Park Site. There is an active Badger population within the Energy Park Site. There are a number of common farmland birds using the Energy Park area. There are a small number of birds that contribute to the Wash SPA wintering in the area including a small flock of Pink-footed geese feeding on one section of Grid Connection route.

8.2 Assessment of potential for likely significant effects

During construction of the Energy Park there is a risk of dust deposit or silt runoff or disturbance to boundary habitat, woodlands, ponds, and wetlands. There is also risk of disturbance to wintering birds, nesting birds, brown hare, and badger during construction.

8.3 Mitigation and Enhancement

The initial design and construction methods will ensure negative effects are minimised from

the outset. The initial design of the Energy Park ensured a 9m stand off from all IDB watercourses which will ensure protection of water vole should they re-colonise the Energy Park Site. Direct drilling under the South Forty Foot Drain will ensure no negative effects on the Local Wildlife Site.

The initial design also includes the creation of 96ha of species rich grasslands and 1.8ha of traditional orchard managed specifically for nature conservation, largely to the south of the Energy Park Site. A further 46ha of species rich grassland within the Energy Park Site will be managed to maximise the nature conservation value. These open high quality grasslands will be managed to maximise their value for ground nesting farmland birds, bees, butterfly and other invertebrates. These grasslands will also provide extensive foraging habitat for brown hare and badger.

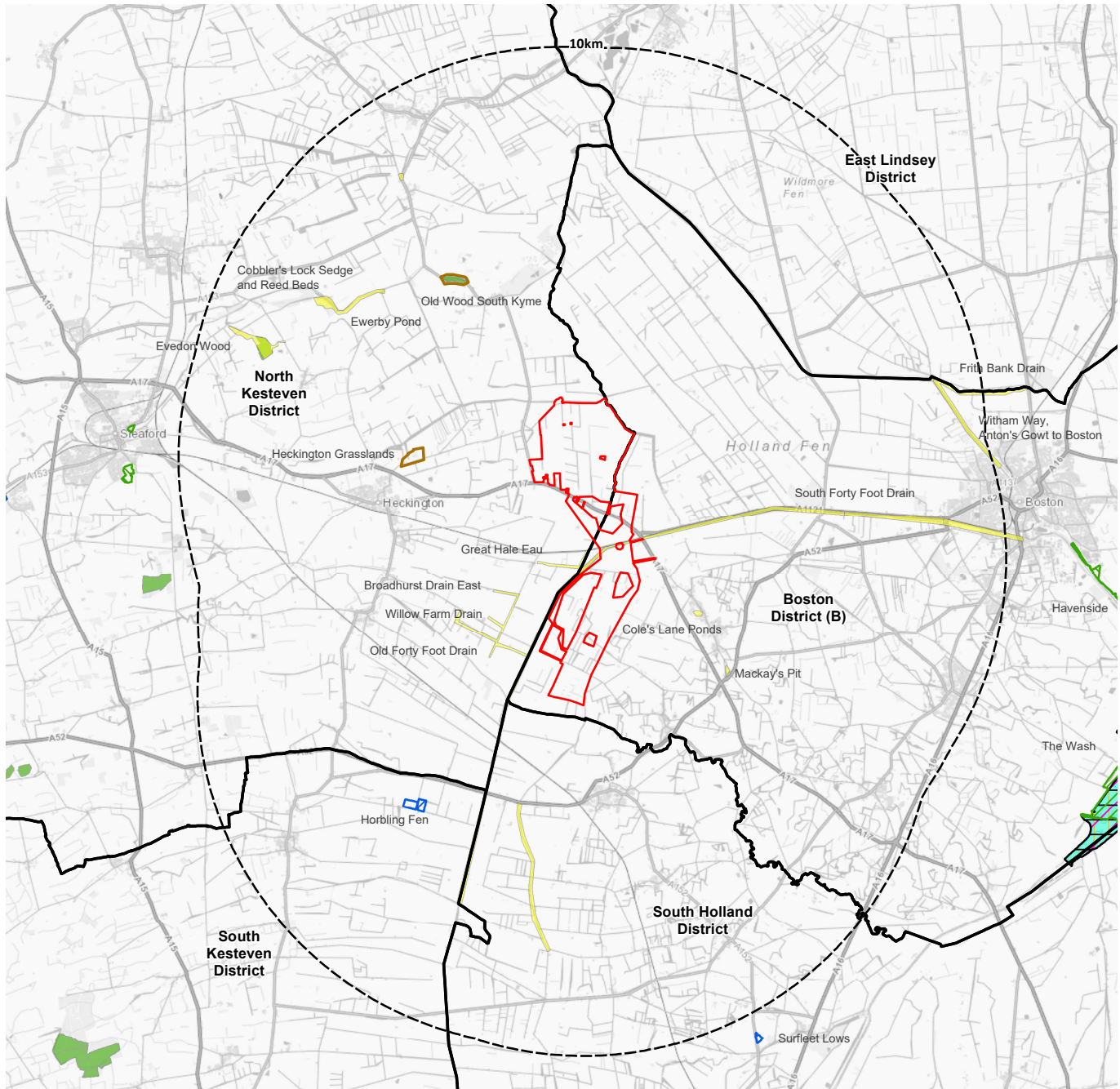
Beneath the solar panels 440ha of intensive arable farmland will be converted to low intensity sheep pasture. The conversion of the land from intensive arable to grass pasture will also dramatically reduce the runoff of agri-chemicals and topsoil into in the Wash SPA via the drainage network. There will be an overall significant residual, locally beneficial effect on biodiversity of area. The preliminary Net Biodiversity Gain calculation estimated a net gain 205.8%.

The implementation of a comprehensive Construction Environmental Management Plan (CEMP) will ensure there is no damage to any hedgerow, woodland or watercourses during construction. The implementation of this CEMP will ensure there is no significant disturbance or risk of injury or mortality of breeding farmland birds, disturbance to wintering wetland birds or disturbance and risk of injury to badger or brown hare.

8.4 Conclusion

The majority of the land is considered to be of low nature conservation value. Any temporary disturbance or risk of harm can be minimised through the implementation of a comprehensive Construction Environmental Management Plan. The initial design of Energy Park and on-going management will ensure that there is an overall biodiversity gain.

Overall, the Proposed Development with embedded and additional mitigation will have very few residual effects and none anticipated to be significant under the EIA Regulations. The Proposed Development would be acceptable in respect of ecology.



0 5 km



- KEY**
- Site Boundary
 - Local Authority Boundary
 - Site of Nature Conservation Interest
 - Local Wildlife Site
 - Local Nature Reserve (LNR)
 - National Nature Reserve (NNR)
 - RAMSAR
 - Special Area of Conservation (SAC)
 - Special Protection Area (SPA)
 - Site of Special Scientific Interest (SSSI)
 - RSPB Reserve
 - Ancient Woodland

FIGURE 16: ECOLOGY AND ORNITHOLOGY DESIGNATIONS PLAN

HYDROLOGY, HYDROGEOLOGY, FLOOD RISK AND DRAINAGE

The PEIR Chapter has set out the assessment of likely significant effects of the Proposed Development upon hydrology, hydrogeology, flood risk and drainage arising from the construction, operation and decommissioning of the Proposed Development.

The assessment was supported by the collection and interpretation of data and information requested from the Environment Agency (EA), Black Sluice Internal Drainage Board (BSIDB) and North Kesteven District Council (NKDC). This information has been used to characterise the baseline water environment and identify receptors.

9.1 Baseline Conditions

The Proposed Development is situated on the Lincolnshire Fens, a coastal plain in the east of England which comprises a large area of broad, flat marshland.

The principal watercourses in the area are the River Witham and South Forty Foot Drain, located approximately 4km and 1.5km to the east and south of the proposed Energy Park respectively. Both are classified as Main River and therefore under the jurisdiction of the EA. The Energy Park itself is bound along the northern boundary by the Head Dike/Skerth Drain (which is also classified as Main River) and the site area is bisected by a number of ditches/drains, some of which are operated and maintained by the BSIDB. Water levels within the network of ditches/drains are managed through pumping to the Head Dike/Skerth Drain. **Figure 17** shows the hydrological features within the vicinity and surrounding area of the Proposed Development.

The Energy Park Site is currently in agricultural use and therefore comprises permeable surfaces, such that surface water run-off generally infiltrates into the ground or is routed

to the various ditches/drains that bisect the site. Similarly, the off-site cable route traverses an area characterised by agriculture.

According to the EA's flood map, the majority of the Energy Park Site is located within Flood Zone 3 (High Probability – land having a 1 in 100 or greater annual probability of fluvial flooding) and benefits from flood defences offering a 1 in 10-year standard of protection.

The off-site cable route and National Grid Bicker Fen Substation are also shown to lie within Flood Zone 3.

The EA 'Flood Risk from Surface Water Map' shows that the majority of the Energy Park and the off-site cable route and National Grid Bicker Fen Substation are at 'Very Low' risk of surface water flooding.

The EA 'Flood Risk from Reservoirs Map' shows the area that may be affected by flooding as a result of a breach of a large, raised reservoir i.e., capable of storing over 25,000 cubic metres of water above the natural level of any part of the surrounding land. According to EA records, the nearest reservoir is located approximately 8km to the west of the Energy Park, between Heckington and Sleaford. The EA's map shows that, when river levels are normal, only limited and localised areas along the northern boundary of the Energy Park adjacent to Head Dike are affected by reservoir flooding. The off-site cable route and National Grid Bicker Fen Substation are unaffected by reservoir flooding when river levels are normal.

British Geological Survey mapping indicates that the Energy Park, off-site cable route and National Grid Bicker Fen Substation are entirely underlain by superficial and bedrock deposits comprising predominantly low permeability clay (see **Figure 18**). EA aquifer designation maps categorise both the superficial deposits and bedrock deposits as 'unproductive' (i.e.

areas comprised of rocks that have negligible significance for water supply or baseflow to rivers, lakes and wetlands).

The Proposed Development lies within the 'Black Sluice IDB draining to the South Forty Foot Drain Water Body', which is designated as 'heavily modified' (substantially changed in character as a result of physical alterations by human activity). The environmental (Water Framework Directive) objective for the water body is to achieve 'good ecological potential'. The overall water body classification is currently 'Moderate' potential (Cycle 2, 2019).

9.2 Assessment of potential for likely significant effects

The assessment finds that construction activities have the potential to impact upon the surface water drainage regime and increase surface water run-off from the Proposed Development. Similarly, the assessment identifies the potential for construction activities to give rise to the contamination of surface water resulting from spilled hydrocarbons/petrochemicals from construction plant and the mobilisation of silts and contaminants during soil stripping and earthworks operations, potentially leading to increased silt loading in watercourses.

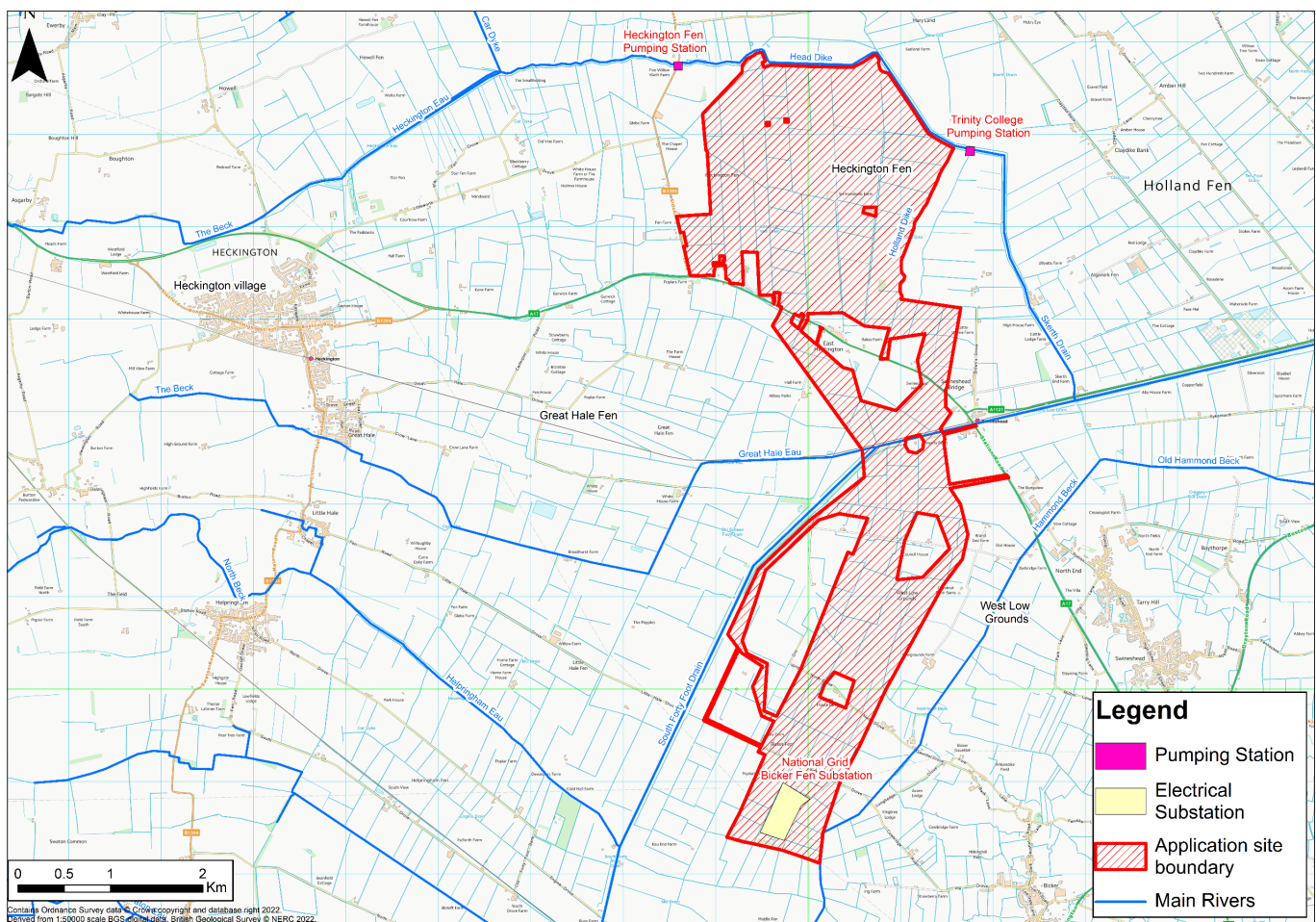


FIGURE 17: HYDROLOGICAL FEATURES

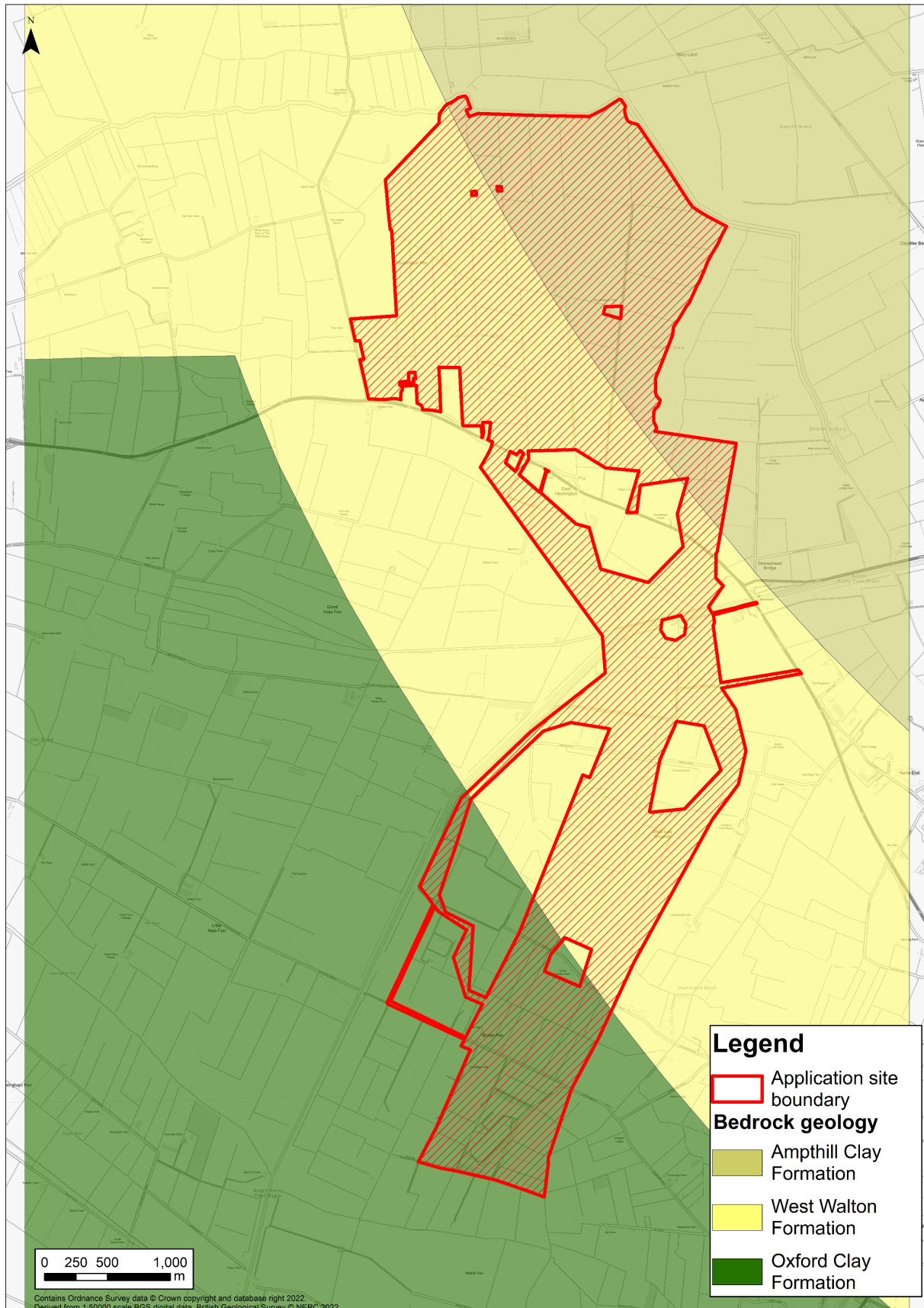


FIGURE 18: BEDROCK GEOLOGY

The assessment also notes that construction works in close proximity to the flood defences have the potential to affect the stability of the embankment and therefore the structural integrity of the defences. Also, floodplain storage and flood flows/flood routing processes may be affected as a result of construction activities and earthworks operations within the floodplain, such that there is potential to increase flood risk locally and downstream.

However, the assessment finds that these likely effects are Not Significant, on account of 'mitigation by design'/embedded mitigation measures that are either 'built-in' to the proposals from the outset or secured through a DCO requirement.

Potential construction phase effects upon groundwater aquifers are found to be Not Significant, principally on account of the low permeability of the ground and the unproductive nature of the aquifers.

During the operational phase of the Proposed Development, the assessment finds that an increase in the impermeable area within the Energy Park Site has the potential to increase surface water run-off to the adjacent drains, potentially increasing flood risk elsewhere. Similarly, the assessment identifies the potential for the contamination of surface water entering the local surface water drains, resulting from the flushing of silts and hydrocarbons from areas of hardstanding. However, the assessment finds that these likely effects are Not Significant, on account of 'mitigation by design'/embedded mitigation measures that are either 'built-in' to the proposals from the outset or secured through a DCO requirement.

The assessment also notes that the raising of ground levels to locate flood-sensitive infrastructure above the flood level has the potential to reduce the volume of storage

available within the floodplain. However, the assessment notes that any such ground raising would be very small scale and localised and located within a significant expanse of floodplain. On this basis, it is concluded that the likely effects are Not Significant.

Potential operational phase effects upon groundwater aquifers are found to be Not Significant, principally on account of the low permeability of the ground and the unproductive nature of the aquifers.

The electrical connection to the National Grid Bicker Fen Substation comprises an underground cable that would not require water, nor be sensitive to flood risk. The assessment therefore concludes that, during the operational phase, it would not give rise to impacts upon hydrology, hydrogeology, flood risk and drainage.

9.3 Mitigation and Enhancement

Potential effects arising from construction of the Energy Park, off-site cable route and works at the Bicker Fen Substation are likely to be localised and temporary and controlled by embedded mitigation measures. The effects are therefore Not Significant and there is no requirement for additional mitigation measures.

At the end of its operational life, the decommissioning of the Energy Park is considered to have similar effects upon the water environment as those during the construction stage and, therefore, similar measures to reduce effects are likely to be proposed. On this basis, it is concluded that there is unlikely to be a requirement for additional mitigation measures.

At the end of its operational life, it is anticipated that the off-site electrical cabling would be left in situ, although all above ground works would be removed. As such there would be limited decommissioning works and therefore

limited or no potential effects upon hydrology, hydrogeology, flood risk and drainage.

The electrical connection comprises an underground cable such that, during the operational phase, it would not give rise to impacts upon hydrology, hydrogeology, flood risk and drainage.

With the implementation of embedded mitigation measures the effects associated with operation of the Energy Park are Not Significant. On this basis, there is no requirement for additional mitigation measures over and above those identified.

9.4 Conclusion

It is concluded that potential effects arising from construction of the Proposed Development are likely to be localised and temporary and controlled by embedded mitigation measures. The residual effects are therefore Negligible and Not Significant.

With the implementation of embedded mitigation measures, the residual effects associated with operation of the Energy Park are Negligible and Not Significant. The electrical connection to the National Grid Bicker Fen Substation comprises an underground cable that would not give rise to impacts upon hydrology, hydrogeology, flood risk and drainage during the operational phase.

CULTURAL HERITAGE

The PEIR Chapter has considered potential effects upon the significance of cultural heritage receptors. Buried archaeological remains, earthworks, buildings / structures, and all other aspects of the historic environment have all been considered.

10.1 Baseline Conditions

No designated heritage assets are located within the land being considered for the Proposed Development.

Known and potential non-designated heritage assets located within the Energy Park Site comprise the upstanding remains of a derelict outfarm, a boundary wall, and a drainage pump; and the buried remains of a former duck decoy, former outfarms and field boundaries, and rectilinear and linear ditched features of uncertain origin.

There is currently nothing to suggest that these buried remains are or would be of the highest heritage significance in and of themselves, but the need for and timing and scope of further archaeological investigations to clarify this will be negotiated and agreed through forthcoming discussions between Pegasus Group and Lincolnshire County Council, North Kesteven District Council and Boston Borough Council.

There are many Scheduled Monuments, Listed Buildings, Conservation Areas and non-designated heritage assets located within a minimum 5km-radius of the Energy Park Site (see **Figure 19**). Assessment work to date has indicated that the Grade I Listed Kyme Tower at South Kyme, the non-Listed Primitive Methodist Chapel on Sidebar Lane, and the non-Listed Mill Green Farmhouse may be particularly sensitive to the Proposed Development through change to their setting.

10.2 Assessment of potential for likely significant effects

No significant effects have been identified through the assessment work that has been undertaken to date. This includes direct effects as a result of truncation or destruction of buried archaeological remains, and indirect effects as a result of changes to setting.

10.3 Mitigation and Enhancement

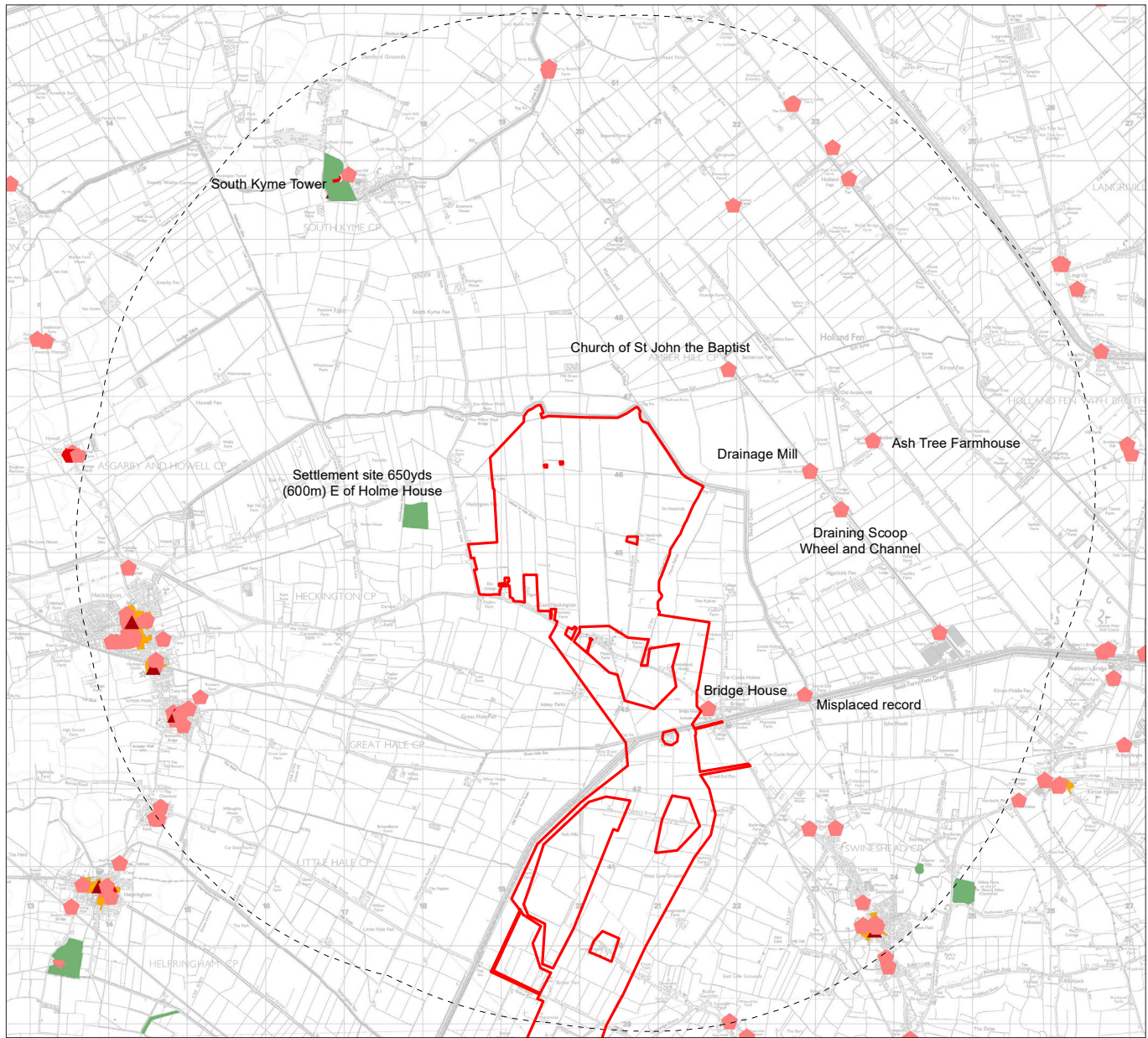
At this stage, no mitigation through design is considered necessary for archaeology but planting may be necessary to screen the Energy Park in views from selected heritage assets.

Mitigation may also be required pre-commencement to counter the impacts of construction activities upon the known and potential buried archaeological resource of the Energy Park Site. This may also be required along the off-site cable route, but the geophysical survey of this route is proposed after the 2022 harvest. Once this data has been gathered the need for mitigation can be assessed further.

10.4 Conclusion

This chapter has identified no significant residual effects in respect of cultural heritage assets (above and below ground) that would arise from a development of the nature and on the scale proposed.

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- KEY**
- Proposed Development
 - 5km from Energy Park
 - Scheduled Monuments
 - Conservation Areas
- Listed Buildings
- Grade
- ▲ I
 - ⬠ II
 - ⬡ II*

NB Heckington and Swineshead Conservation Areas are concealed by the overlying Listed Buildings layer.

FIGURE 19: DESIGNATED HERITAGE ASSETS

SOCIO-ECONOMIC

The Socio-Economic chapter of the PEIR has analysed the baseline socio-economic conditions and then gone on to assess the likely socio-economic effects of the Proposed Development.

11.1 Baseline Conditions

North Kesteven experienced population growth of 8.8% between 2011 and 2020 (9,600 additional people), and in Boston there was a relatively higher population growth of 9.6% (6,200 additional people). Relative to the benchmark areas of East Midlands and Great Britain, North Kesteven and Boston's population grew at a faster rate over this timeframe. Employment growth in North Kesteven over the last five years has been strong with 7.7% increase in job numbers, especially when compared to the picture at a regional and national level (2.4% and 2.2% respectively). There was no employment growth in Boston in that same period. Lincolnshire County experienced a very similar rate of employment growth (2%) as at the regional and national scale. The construction sector, which is likely to see increased employment opportunities during the Proposed Development's build phase represents 7.1% of total employment in the District, which is above the proportion of total jobs at the regional scale (4.7%) and Great Britain (4.9%). North Kesteven has a net outflow of commuters, while Boston has a net inflow of commuters. The claimant count, (a measure of the number of people claiming unemployment related benefit), in Boston has risen by 2.3% (additional 1,005 claimants) in the period March 2019 to April 2022 and is currently above all other comparator areas. The claimant count in North Kesteven increased but only by 0.5% in this period and is well below all other comparator areas as well as Boston.

11.2 Assessment of potential for likely significant effects

In respect of the construction phase, the assessment indicates that the Proposed Development will have the following temporary effects:

- 67 direct and indirect/induced construction jobs and indirect/induced supply chain jobs over the 18-month construction programme.
- £29.3million of gross value added over the 18-month construction programme.

The overall socio-economic effect during the construction phase is minor to moderate beneficial in the short term.

In respect of the operational phase, the assessment indicates that the Proposed Development will have the following effects:

- 13 net additional jobs in the North Kesteven economy.
- £625,800 of gross value added per annum or £13.9 million over 40-year lifespan of the project (present value).
- Business rates £1.3 million per annum and £28.8 million over the 40-year project lifespan (present value).

The overall socio-economic effect during the operational phase is minor-moderate beneficial in the long term.

In respect of the decommissioning phase, the assessment indicates that the Proposed Development will have similar scale of effects to those identified during the construction phase. As such, the overall socio-economic effect during the decommissioning phase is expected to be minor to moderate beneficial in the short term.

11.3 Mitigation and Enhancement

Due to the beneficial impacts identified in the assessment, no requirement for additional mitigation measures or enhancement measures has been identified.

11.4 Conclusion

The Proposed Development would lead to no adverse significant residual effects from a socio-economic perspective. The Proposed Development will result in a minor to moderate beneficial effect within the construction, operational and decommissioning period in respect of job creation, gross value added, business rates of receptors and the receiving environment. Continued efforts to address wider benefits for the community will be undertaken separately and outside of the DCO process.

NOISE AND VIBRATION

This Noise and Vibration chapter of the PEIR has considered the potential effects of noise and vibration associated with the Proposed Development, both associated with the different construction and decommissioning activities and traffic, as well as the operational phase.

12.1 Baseline Conditions

The baseline conditions were determined from a combination of new survey work and reference to historical data captured at noise-sensitive receptors neighbouring the Site (see **Figure 20** for noise assessment locations surveyed around the vicinity of the Proposed Development).

12.2 Assessment of potential for likely significant effects

The assessment has identified potential significant noise effects if trenchless work is required and remains active at night, depending on the final locations where this may be required along the grid connection route.

Noise and vibration from other construction activities may be audible or perceptible at times but the worst-case levels are such that, providing construction working hours are controlled in a standard manner, their effect would be either not significant or negligible. Construction traffic is associated with negligible effects.

Operational noise from electrical or mechanical plant could be sufficiently high in relation to the baseline noise environment and context of the area (during quieter periods of the evening and night), on the basis of worst-case assumptions, such that this could result in a significant effect at some of the closest receptors to the Site.

12.3 Mitigation and Enhancement

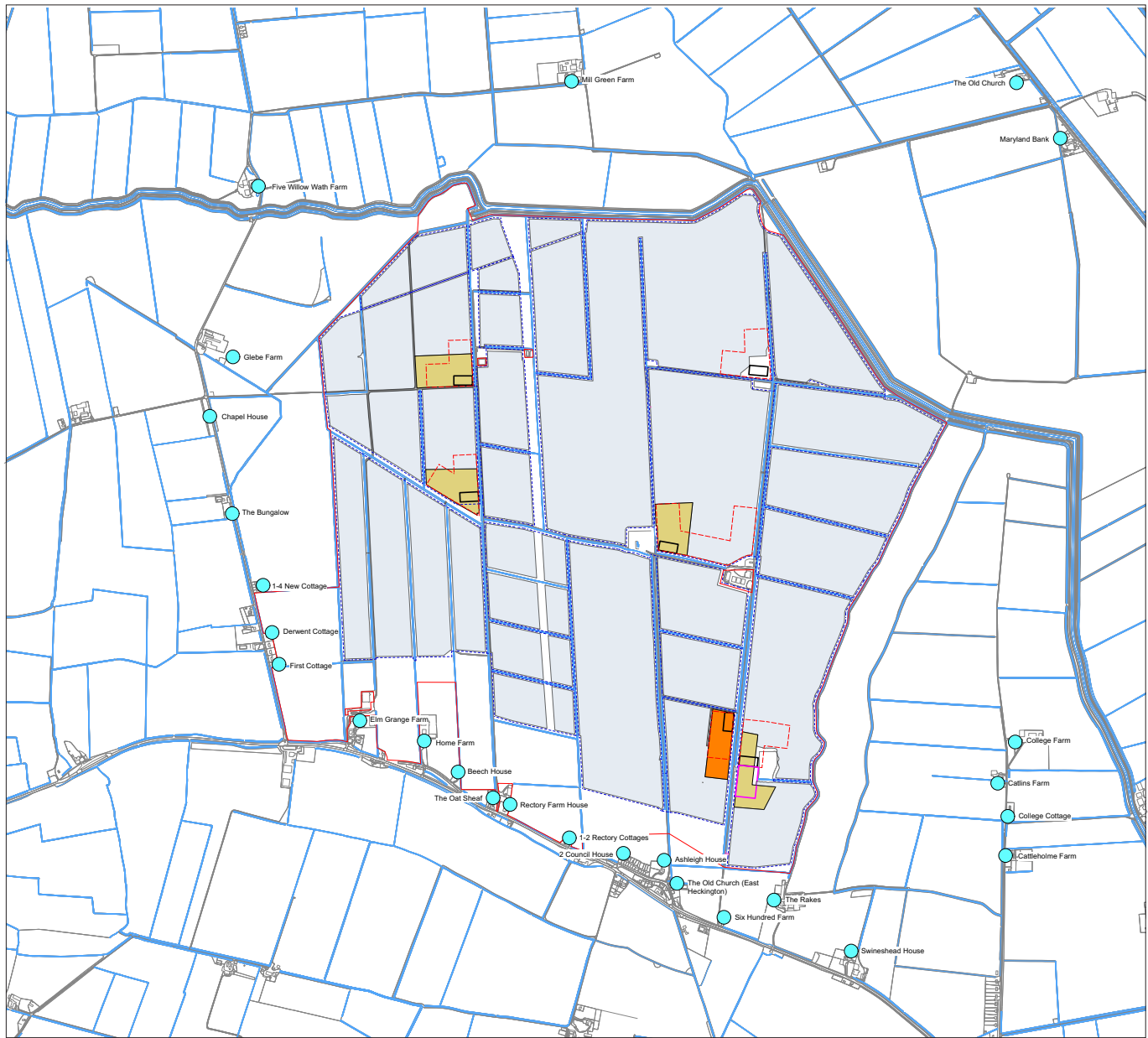
Construction working hours would be controlled for most noise-generating activities (including restrictions on piling work for Saturday afternoons), and good practice measures would further reduce noise levels in practice.

The potential effects of trenchless construction if required for night-time work would be minimised and managed through the design of the grid connection route and use of localised screening, and liaison with the closest affected residents. Where these works are required in relative proximity to sensitive receptors, such that significant effects remain likely, alternative techniques, interruption of the drilling at night or offer of temporary re-housing (for the duration of these works) would be investigated. Worst-case residual effects could however remain significant should these measures not be possible to implement in practice.

Operational noise would be controlled to a set of proposed noise limits at the nearest noise-sensitive receptors through detailed design and selection of electrical/mechanical equipment, attenuation and/or screening measures. The residual effects would then be either not significant or negligible.

12.4 Conclusion

It is therefore concluded that the effects of the Proposed Development can be suitably controlled such that significant residual adverse effects are eliminated where reasonably practicable.



KEY	
	Site Boundary
	Security Fence
	Construction Compound
	Primary Energy Storage
	Indicative 400kV Substation Location
	Indicative 132kV Substation Location
	132kV Substation and Energy Storage Zone
	Noise Assessment Locations

FIGURE 20: NOISE ASSESSMENT LOCATIONS

CLIMATE CHANGE

To reflect the requirements of the 2017 EIA Regulations, an assessment has been undertaken of the potential effects of the Proposed Development on climate change adaptation. In accordance with recognised guidance, this has included both the vulnerability of the Proposed Development to climate change and also any implications of climate change for the predicted effects of the project, as assessed by the other topic specialists ('in-combination climate effects').

13.1 Baseline Conditions

Baseline conditions have been determined with respect to average maximum and minimum summer and winter temperatures, average summer and winter sunshine hours and average summer and winter wind speeds.

With respect to future baseline conditions, the assessment uses the UKCP18 climate projections for the 2080s which suggest that, in future, the Site and its surroundings will experience warmer, drier summers and milder wetter winters. Whilst heavy rain days are likely to increase throughout the year, there is still considerable uncertainty with respect to likely changes in both wind speed and storm frequency/intensity. All other ES topic area authors were provided with a summary of the climate change projections and were asked to consider the relevance of this for their baseline descriptions. Whilst some possible changes were noted, it was not felt that baseline conditions would be materially altered to such an extent that this would need to be reflected in the subsequent assessments of effects.

13.2 Assessment of potential for likely significant effects

With respect to the vulnerability of the Proposed Development, it is not considered that the project could be affected by climate change to such an extent that the construction and/or operation of the Proposed Development could potentially become unviable. Therefore, no significant adverse effects are predicted.

With respect to 'in-combination climate effects', the assessment considered the projected climate change projections in more detail in relation to landscape and visual amenity (operational phase), cultural heritage (construction phase) flooding and drainage (construction and operational phase), ecology (construction and operational phase) and noise (operational phase). No new significant effects were identified for these topic areas as a consequence of projected climate change.

13.3 Mitigation and Enhancement

Whilst a number of mitigation measures will be included to ensure project resilience, effects will remain as outlined above.

No additional mitigation is required in relation to in-combination climate effects. Effects will remain as outlined above.

13.4 Conclusion

No significant residual effects have been predicted in relation to climate change adaptation, either for the Proposed Development in isolation or cumulatively.

TRANSPORT AND ACCESS

The Transport and Access PEIR chapter assesses the potential effects relating to transport and access. It considers the potential effects on vehicular traffic flows, accidents and safety, severance, driver delay, hazardous and dangerous loads and dust and dirt.

The PEIR chapter has been prepared alongside a supporting Draft Outline Construction Traffic Management Plan.

14.1 Baseline Conditions

The Energy Park Site is located to the immediate north of the A17, approximately 3.7km to the east of Heckington and around 8km to the west of Boston.

Access to the Energy Park during the construction and operational phases is proposed with the A17 to the south of the site, approximately 900m northwest of the junction with Six Hundreds Drove. Whilst the proposed access is under construction, a temporary construction access will be provided via an existing junction with the A17, approximately 600m southeast of B1395 Sidebar Lane junction (see Figure 12 for proposed site accesses). The cable route will be accessed using existing junctions with the A17.

At this stage, the exact point of access to the proposed Point of Connection (PoC) is not confirmed. However, it is anticipated that access to the north of the railway line will be served via Parks Farm. The preferred access option to the south of the railway is via the Triton Knoll or National Grid access points at the A17 and the A52 Bicker Road respectively. However, the assessments have also considered access to the PoC via Royalty Lane. Where possible, any access and routing options would seek to avoid Bicker.

Baseline surveys from 2022 confirm that daily (24 hour) traffic flows past the site on the A17 are up to around 21,307 vehicles with around 16 percent HGVs. Data from the most recent five-year period show that there are not any existing highway safety issues on the local highway network that would be exacerbated by the Proposed Development.

14.2 Assessment of potential for likely significant effects

Impact Magnitudes have been defined for the construction phase with regard to 'Guidelines for the Environmental Assessment of Road Traffic', which states that a significant environmental impact may occur when traffic flows increase by more than 10% where the study area is of high sensitivity significance. This has, for the purposes of this assessment, been considered to represent a negligible impact significance.

The impact of the construction phase traffic is considered to be of Negligible significance.

14.3 Mitigation and Enhancement

Mitigation will be provided in the form of a Construction Traffic Management Plan (a draft Outline of which has been included within the PEIR) to reduce the impacts of the construction phase.

14.4 Conclusion

It is concluded that the proposed package of mitigation will ensure that the Proposed Development is acceptable and that there will be no adverse significant residual effects. There are therefore no highways or transportation reasons which should prevent the Proposed Development.

AIR QUALITY

The Air Quality PEIR Chapter focuses on the potential air quality effects at existing sensitive receptors during the construction phase.

15.1 Baseline Conditions

The Proposed Development is not located within or near to an Air Quality Management Area (AQMA).

Monitored concentrations in the vicinity of the Proposed Development show pollutant concentrations have been below the Air Quality Objectives (AQO) for the last five years of representative monitoring data (see **Figure 21**).

15.2 Assessment of potential for likely significant effects

Predicted construction traffic flows have been screened against Environment Protection UK (EPUK) and Institute of Air Quality Management (IAQM) guidance and considered to be not significant.

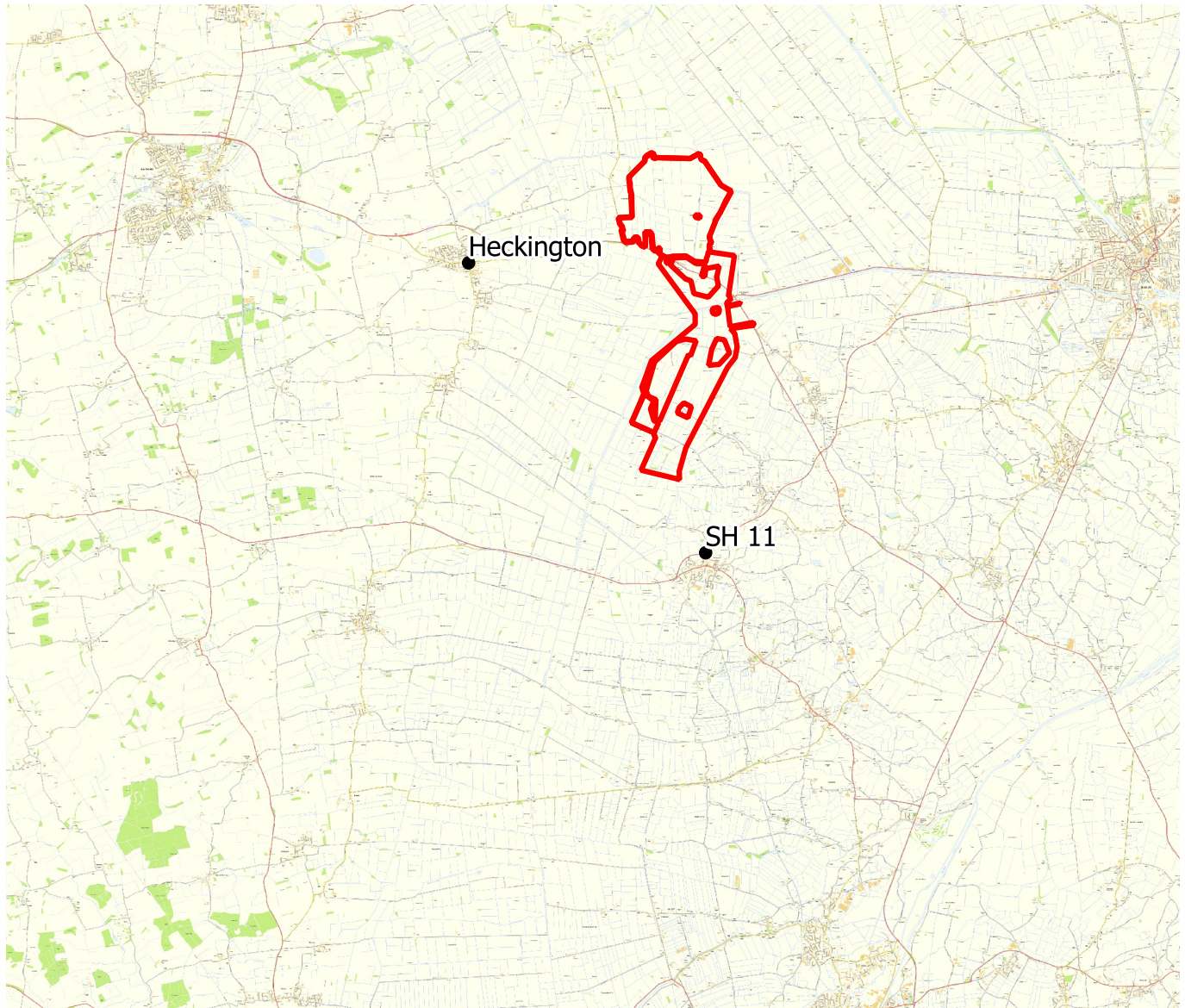
In addition, dust and non-road mobile machinery emissions during the construction phase will be controlled via a Construction Environmental Management Plan (CEMP) and as such are considered to be negligible and therefore the effects are not significant.

15.3 Mitigation and Enhancement

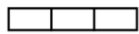
Construction phase emissions to air will be controlled by a CEMP and Construction Traffic Management Plan (CTMP).

15.4 Conclusion

It is concluded that the proposed package of mitigation will ensure that the Proposed Development is acceptable and that there will be no adverse significant residual effects to air quality.



0 1 2 3 km



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KEY




-  Proposed Development Boundary
-  Diffusion Tube Location
-  Automatic Monitoring Station

FIGURE 21: AIR QUALITY MONITORING LOCATIONS

LAND USE AND AGRICULTURE

The Land Use and Agriculture PEIR Chapter focuses on the agricultural land quality of the Energy Park and potential effects of the Proposed Development on agricultural land and businesses during construction, operation, and decommissioning.

16.1 Baseline Conditions

Agricultural land quality is assessed by use of the system of Agricultural Land Classification (ALC). The ALC system divides land into five grades 1 to 5, with grade 3 divided into subgrades of 3a and 3b. The National Planning Policy Framework (NPPF) (2021) places Grades 1, 2 and 3a within the definition of the 'best and most versatile agricultural land' (BMV).

An ALC survey of the Energy Park was undertaken in late 2021. The ALC results of the Energy Park area showed 45% of the land is Grade 3b, 30% Grade 3a, 13% Grade 2, 11% Grade 1 and 1% Non-Agricultural (see **Figure 22**). The Energy Park covers an area of land which is greater than the area where solar panels, energy storage, and ancillary equipment will be installed as it also includes Biodiversity Net Gain areas.

16.2 Assessment of potential for likely significant effects

The potential for adverse effects on agricultural land (both on the soils and the land quality) is greatest during the construction phase. The trafficking of agricultural land by construction vehicles and machinery, the timing of work on soils and the timing and methodology of cable laying will be required to be carried out in accordance with industry good practice and methodologies tailored specifically for the soils within the Energy Park.

There will be areas where fixed equipment is required, especially transformers. These may be placed on concrete pads or on concrete point foundations, but there is likely to be a need to

remove topsoils to construct base areas. So far as possible and practicable, areas of fixed equipment will be located on the lowest quality agricultural land available.

There should not be a direct loss (permanent sealing or downgrading of land quality) of one or more soil functions by the installation of the PV arrays. The construction process involves piling support poles into the soils but there is no disturbance to the land, and the land is not sealed.

There will be normal ongoing agricultural grazing land uses and agricultural management of the grassland beneath the PV arrays and the areas used for ecological enhancement (the biodiversity net gain areas) during operation. The potential for an adverse impact on soils and land quality during the operational phase is therefore considered to be negligible.

There is the potential to damage soils and soil structure, and in extreme cases there is the potential to bring about localised reduction of agricultural land quality, during the decommissioning phase. Damage to soil structure is generally a short-term effect recoverable with normal agricultural cultivation equipment.

The Heckington Fen Proposed Development is a standalone proposal not connected to any other proposed developments, solar or otherwise. As such there are no direct cumulative effects on the use of agricultural land, and on any agricultural land losses, with other developments. Within Lincolnshire County there are four other NSIP solar schemes applying for DCO consent, and a further five solar schemes within 11km of the Proposed Development. Therefore, if all of these schemes were to gain planning consent, and all of the land within the application redlines was used for solar development the total use of agricultural

land would be 3,965ha. The Energy Park Area for the Heckington Fen Proposed Development is 589ha. If all 10No. schemes gained planning consent and became operational then the total use of agricultural land in Lincolnshire would be 4,554ha.

Table 1 shows this use of agricultural land when compared to the total area of agricultural land within Lincolnshire.

TABLE 1: TOTAL CUMULATIVE USE OF AGRICULTURAL LAND IN LINCOLNSHIRE (BASED ON THE 1977 MAFF PROVISIONAL ALC, SEE TABLE 16.3 ABOVE)

	Total Area (ha)	Percentage
Total Area of Lincolnshire	591,800	100%
Total Area of Agricultural Land within Lincolnshire	566,200	96%
Total Cumulative Area from 10No Solar Farms in Lincolnshire	4,554	0.8%

It can therefore be concluded that if all of these ten solar farms became operational and none carried out any ongoing agricultural practices within their application sites for their operational lifetimes, 0.8% of Lincolnshire’s agricultural land would be used for solar farms.

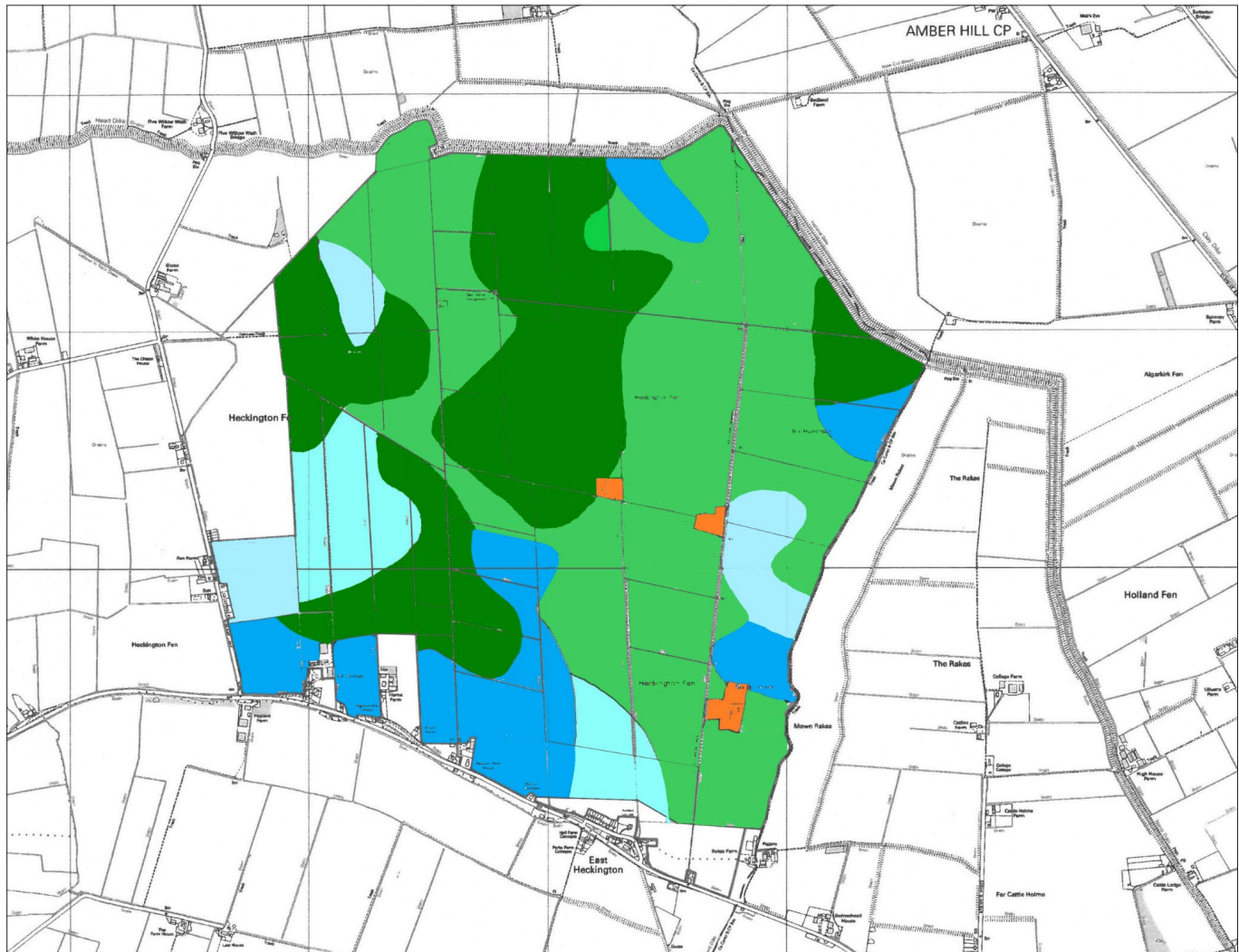
16.3 Mitigation and Enhancement

This preliminary assessment has identified that there are no significant adverse effects on agricultural land quality that cannot be mitigated. The preliminary view is that through a combination of careful mitigation, management and good practice measures, which would be implemented through the CEMP (to be secured via a requirement through the DCO), at the construction and decommissioning

phase, the agricultural land quality will not be significantly adversely affected. The overall effects on soils and agricultural land quality are not anticipated to be significant. With careful planning and practice any localised effects on farm businesses can be avoided or mitigated, and measures secured within the CEMP.

16.4 Conclusion

It is concluded that the area of land that will be irreversibly developed (as a result of internal access tracks and foundations for the substations and transformers) is likely to be less than 5ha of best and most versatile agricultural land, and consequently this will be a slight adverse effect. However, in EIA terms this is regarded as not significant. There are no significant residual effects on soils or farm businesses.



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KEY		Ha	%
	Grade 1	66	11
	Grade 2	77	13
	Grade 3a	175	30
	Grade 3b	263	45
	Grade 4		
	Grade 5		
	Non-agricultural	8	1
	Urban		
	Not surveyed		

FIGURE 22: SEMI DETAILED AGRICULTURAL LAND CLASSIFICATION WIDER SITE AREA

GLINT AND GLARE

The Glint and Glare PEIR chapter assesses the potential glint and glare effects associated with the Energy Park comprising solar photovoltaic (PV) arrays on land at Heckington Fen. The assessment has considered both fixed panel layouts and trackers.

17.1 Baseline Conditions

There are a range of other common materials and surfaces likely to cause glint that are already present in the study area. These include, inter alia:

- glass in windows;
- conservatories or greenhouses;
- flashes caused by light reflecting off passing vehicles; and
- calm water.

Since it is not possible to assess all reflective materials in the 5km study area due to the sheer number of potential reflective surfaces present, the baseline will assume there is no other glint present. **Figure 23** shows the receptors of interest assessed within the Glint and Glare assessment.

17.2 Assessment of potential for likely significant effects

In both cases the modelling has predicted theoretical potential for 'yellow' glint. That is glint which is of medium intensity and which has potential for temporary after image (i.e. an image that continues to appear in the eyes after a period of exposure to the original image). This glint is considered to be significant.

The Zone of Theoretical Visibility (ZTV) modelling does not account for intervisibility between receptor and the Energy Park. The ZTV reveals that, based on a bare earth model, nearly everywhere within the study area would be visible due to the very flat landscape. The ZTV is based on a maximum panel height of 4.5m and a receptor height of 1.8m.

In reality, screening in the form of intervening trees, hedgerows, buildings and other surface features would eliminate much of this potential for glint. Consideration has been given to the level of screening within the intervening landscape.

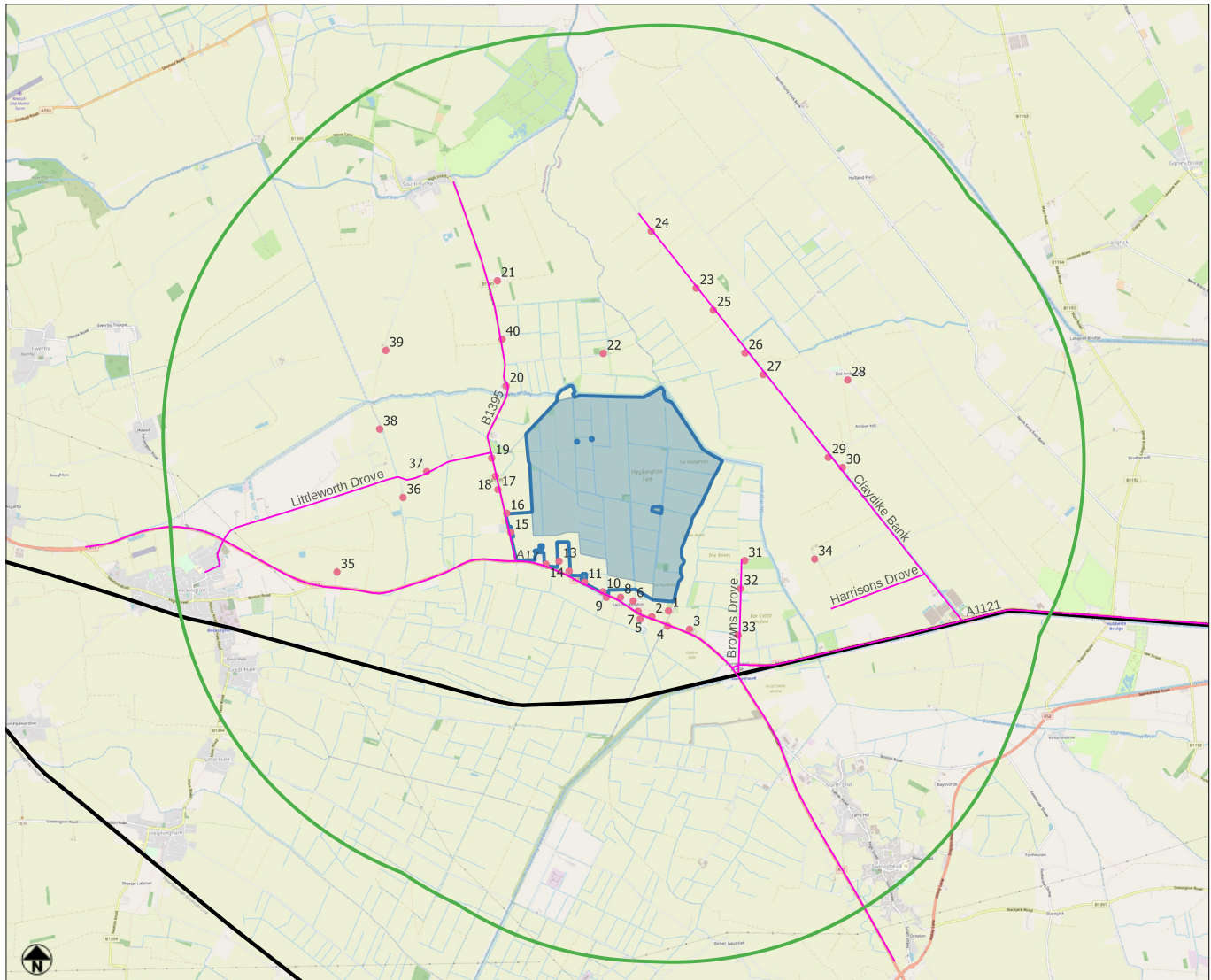
Even accounting for screening present, some receptors still have potential to receive glint. On this basis further mitigation in the form of increased hedgerow screening around the perimeter of the Energy Park is proposed to minimise the potential for any glint effects to occur.

17.3 Mitigation and Enhancement

Following the implementation of such mitigation it is expected that residual effects would be negligible.

17.4 Conclusion

With suitable mitigation it is expected that all glint effects can be managed effectively and there will be no residual effects.



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	Energy Park Boundary
	Proposed Panel Area
	Panel Area - 5km Buffer
	Observation Points (Dwellings)
	Road Routes
	Rail Routes

Notes: This map shows the various receptors that are considered in more detail in the Glint chapter of the PEIR.

FIGURE 23: RECEPTORS OF INTEREST

MISCELLANEOUS ISSUES

The PEIR Chapter on Miscellaneous Issues assesses the following topics: major accidents and disasters; electric, magnetic and electromagnetic fields; telecommunications, television reception and utilities; and waste. None of these warrant individual chapters in the PEIR, either due to the brevity of the assessment or the small impact associated with the Proposed Development.

18.1 Major Accidents and Disasters

This section summarises the potential effects of the project on the risks of major accidents or disasters occurring and affecting the Proposed Development. 'Accidents' are an occurrence resulting from uncontrolled developments in the course of construction, operation and decommissioning (e.g., major emission, fire or explosion). 'Disasters' are naturally occurring extreme weather events or ground related hazard events (e.g., subsidence, landslide, earthquake).

Baseline Conditions

A number of receptors are present in the vicinity of the Proposed Development which could be vulnerable to major accidents or disasters, either because of their proximity to the Proposed Development or their importance to the surrounding area. These include:

- Towns, villages, farms and residential homes;
- Commercial sites and buildings;
- Roads;
- Railways;
- Designated ecological sites, woodland, farmland, and waterbodies; and
- Underground infrastructure services including electricity, water, communications, and gas.

Assessment of potential for likely significant effects

There are various health and safety considerations particularly for workers during construction and decommissioning of the Development. Workers are in the closest proximity to the Development as a result are considered to be the most at-risk group. However, the risk to both construction workers and the general public is low and not significant during the construction and decommissioning phases.

The design of the Proposed Development's infrastructure, such as batteries, could lead to a fire risk if there was equipment failure. Routine maintenance, system testing, fire protection design for battery equipment would result in the risk of major disaster or accident as not significant.

The cable route corridor for the two potential grid connection route crosses the railway line connecting Grantham to Skegness, also known as the 'Poacher line'. The underground cable crossing will be managed to the specific requirements of Network Rail and therefore the risk of a rail accident as a result of the crossing will be minimised and considered not significant.

A high-pressure gas pipeline (Feeder 7 East Heckington to Gosberton) bisects the Site running in a north-south direction through the centre of the Energy Park site. The design of the Proposed Development has ensured risk of major accident or disaster is minimised and considered not significant.

Mitigation and Enhancement

Minimising the risk of major accidents during construction and decommissioning will be addressed through appropriate risk assessments as required in the CEMP.

Conclusion

The Proposed Development is not expected to increase the risk of major accidents or disasters during construction, operation and decommissioning. Therefore, the effects on major accidents and disasters are considered not significant.

18.2 Waste

This section discusses the expected waste streams during each phase of the Proposed Development. Wastes include surplus spoil, scrap, recovered spills, unwanted surplus materials, packaging, office waste, wastewater, broken, worn-out, contaminated or otherwise spoiled plant, equipment and materials.

Baseline Conditions

Waste at the Proposed Development's site area is currently associated with agricultural practice. Potential waste streams currently could include left over crop and straw bales, fertiliser sacks and chemical containers.

Assessment of potential for likely significant effects

The nature of the Proposed Development and the known construction processes indicate no significant quantities of waste are anticipated. The generation of construction-related waste can be significantly reduced through the choice of materials and other opportunities pre-construction phase will be explored as far as possible. Possibilities to reuse or recycle materials will be explored before resorting to landfill options.

During the operational phase of the Proposed Development waste arising is expected to be substantially less than during the construction phase and would include: welfare facility waste; equipment needing replacing; waste metals; and general waste (paper, cardboard, wood, etc.).

During decommissioning, waste streams are expected to include, but not be limited to, solar infrastructure, batteries, cables, welfare facility waste, waste metals, and waste water. Prior to decommissioning, opportunities to minimise waste as far as possible will be explored. There is a new industry emerging for recycling solar panels and it is expected that this industry will be mature by 2067. This would be explored, in addition to any resale of any operational panels

Mitigation and Enhancement

An Construction Environmental Management Plan (CEMP) will be in place for the construction and decommissioning phases. These will include measures to control and manage waste on-site. These will be secured through a DCO Requirement.

Waste arisings will be prevented and designed out where possible. Opportunities to re-use material resources will be sought where practicable. Where re-use and prevention are not possible, waste arisings will be managed in line with the Waste Hierarchy.

Conclusion

The Proposed Development is not expected to create a significant amount of waste during construction, operation, and decommissioning. Therefore, the effects on waste are considered not significant.

18.3 Electric, Magnetic and Electromagnetic Fields

This section sets out the approach to the potential of electric, magnetic and electro-magnetic fields (EMFs) produced by the Proposed Development. EMF is produced both naturally and as a result of certain human activities. EMFs are inevitable wherever electricity is produced, distributed, and used, including electrical substations, power lines and electric cables and around domestic, office or industrial equipment that uses electricity.

Electric fields are produced by voltage. Magnetic fields are produced by the flow of electric current; however, most materials do not readily block magnetic fields. The intensity of both electric fields and magnetic fields diminishes with increasing distance from the source.

Baseline Conditions

The underground 400 kV cable system will be located predominately on private land that is not publicly accessible (although crossing roads and railway underground). However, the public and occupational exposure reference levels have been used in this assessment to ensure that there are no adverse effects on the closest publicly accessible areas and residential areas.

Assessment of potential for likely significant effects

Policy guidance on EMFs states that '**overhead power lines at voltages up to and including 132 kV, underground cables at voltages up to and including 132 kV and substations at and beyond the publicly accessible perimeter**' are not capable of exceeding the ICNIRP exposure guidelines and therefore no assessment is required for these and other types of infrastructure listed on the Energy Networks Association website. National Grid guidance states that, "**Underground cables, whether directly buried or in a tunnel, produce no external electric field.**" Therefore, electric fields are not considered further in this assessment. Magnetic fields for the underground 400kV cabling system are considered.

Effects during the construction and decommissioning phases of the Proposed Development are scoped out of the assessment as the cables will not produce any significant EMFs until the Proposed Development is generating electricity when it is operational.

An underground high voltage 400 kV cable system, buried underground, will be installed to

connect the Proposed Development substation with the existing National Grid Bicker Fen Substation. The highest EMFs produced by underground cables are located directly above the buried cables, and field strength decreases with distance from the source. It has been assessed that even directly above the cable under maximum load, neither the occupational nor public limits will be breached.

Mitigation and Enhancement

The final route alignment and design of the electrical infrastructure will consider the measures required to ensure compliance with the Electricity Safety, Quality and Continuity Regulations 2002 (as amended), and any new advice that may emerge from the Department of Health relating to Government policy for EMF exposure guidelines.

It has been shown that the relevant electrical infrastructure will comply with the current public exposure guidelines, and so no further mitigation is necessary.

Conclusion

The Proposed Development is not expected to create a significant effect on EMFs during construction, operation, and decommissioning. Therefore, the effects on EMFs are considered not significant.

18.4 Telecommunications, Television Reception and Utilities

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

Baseline Conditions

There are understood to be no buried telecommunication infrastructure beneath the Energy Park.

The area within and surrounding the Proposed

Development is predominantly served by the Belmont transmitter (Lincolnshire), which is located approximately 37km north-east of the Proposed Development.

On-site utilities could include water, sewers, a high-pressure gas pipeline and electrical cables. Knowledge of the utilities during design and construction allows any effects to be negated by avoiding them or by use of suitable structures, such as pipe bridges. Consultation is being undertaken with a number of organisations to identify the existing utilities infrastructure within the DCO Site.

Assessment of potential for likely significant effects

The Proposed Development consists of fixed low-lying infrastructure and is therefore unlikely to interfere with digital television signals and therefore no effects are anticipated in the construction, operation and decommissioning phases.

The potential exists for utilities to be affected during the construction and decommissioning of the Development through damage caused as a result of excavation and engineering operations. Risk of damage can be mitigated with precautionary measures.

The underground cabling to the National Grid Bicker Fen Substation will remain in situ with no decommissioning works needed.

Mitigation and Enhancement

The risk of damage to utilities during construction would be minimised through embedded mitigation, which would involve the following measures and mapping infrastructure that crosses the Proposed Development and avoiding it through the design:

- mapping infrastructure that crosses the Proposed Development and avoiding it through the design of the Development;

- the use of ground penetrating radar before excavation to identify any unknown utilities; and
- consultation and agreement of construction / demobilisation methods prior to works commencing. Protective Provisions will also be in place for those affected statutory undertakers and included within the DCO application.

No further mitigation would be required.

Conclusion

The Proposed Development is not expected to create a significant effect on Telecommunications, Television Reception and Utilities during construction, operation, and decommissioning. Therefore, the effects on Telecommunications, Television Reception and Utilities are considered not significant.

SUMMARY

The aim of this PEIR has been to assess the interim findings of the Environmental Impact Assessment and identify the 'likely significant effects' of the Proposed Development. Detailed assessments with respect to pertinent environmental topics have therefore been undertaken in accordance with definitive standards and legislation where available.

The design of the Proposed Development has taken account of the likely significant environmental effects and a number of mitigation measures have been identified to mitigate and control environmental effects during construction, operation (including maintenance) and decommissioning of the Proposed Development to ensure that the environment is suitably protected. It is proposed that these will be secured through appropriate requirements and other controls within the DCO for the Scheme, should this be granted.

Feedback from the formal consultation process will be taken into account when preparing the DCO application and in undertaking the EIA process. The PEIR will be revised and further developed to prepare an ES that will accompany the DCO application. The ES will present the final findings and conclusions associated with the EIA process, based on the worst-case proposed layout and design.



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