Peartree Hill Solar Farm

EIA Scoping Report

November 2023 | Prepared by RSK environment ASSESSMENT • MANAGEMENT • CONSENTS on behalf of JBM Solar Ltd

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TABLES

1 INTRODUCTION

1.1 Background

1.1.1 JBM Solar Ltd, part of RWE, (hereafter, the 'Applicant') has commissioned RSK Environment Limited (hereafter, 'RSK') to prepare an Environmental Impact Assessment (EIA) Scoping Report to accompany a request for a Scoping Opinion from the Planning Inspectorate (prepared on behalf of the Secretary of State) for the proposed Peartree Hill Solar Farm, a proposed solar photovoltaic (PV) electricity generating and storage facility with an export capacity exceeding 50 megawatts (MW) and associated infrastructure (hereafter, the 'Proposed Development'), located in East Riding of Yorkshire. The Site boundary (hereafter referred to as the 'Site') is shown in **Appendix A**.

1.1.2 The Proposed Development is classified as a Nationally Significant Infrastructure Project ('NSIP') and will require a Development Consent Order ('DCO') under the Planning Act 2008. The Proposed Development also falls within the definition of 'EIA development' as defined within the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter, 'EIA Regulations') meaning that before consent is granted for the Proposed Development, an EIA must be undertaken.

1.1.3 This EIA Scoping Report forms a formal request for a Scoping Opinion under Regulation 8(1)(b) and 10(1) of the EIA Regulations.

1.2 Definition of an EIA

1.2.1 The term EIA describes a procedure that must be followed for certain types of projects before 'consent' can be given. The procedure is a means of drawing together, in a systematic way, an assessment of a project's likely significant environmental effects. This helps to ensure that the importance of the predicted effects and the scope for avoiding, preventing, reducing or, if possible, offsetting them are properly understood by the public and the authority granting consent (the 'determining authority') before it makes its decision.

1.3 Requirement for EIA

1.3.1 The EIA Regulations set out the types of development which must be subject to an EIA (referred to as Schedule 1 development) and other developments, which must only be subject to an EIA if the development is considered "*likely to have significant effects on the environment by virtue of factors such as its nature, size or location*" (referred to as Schedule 2 development).

1.3.2 The Proposed Development does not fall under any of the types of development set out in Schedule 1 of the EIA Regulations. However, the

Proposed Development is of a type and scale described in Schedule 2 paragraph 3(a) of the EIA Regulations as follows:

"Energy industry

industrial installations for the production of electricity, steam and hot water (projects not included in Schedule 1 to these Regulations)"

1.3.3 It is considered that due to the Proposed Development's nature, size or location, it has the potential to have significant effects on the environment. The Applicant has therefore concluded that the Proposed Development does require an EIA, and this EIA Scoping Report is accompanied by a notification, under Regulation 8(1)(b), that the Applicant will prepare and submit an Environmental Statement (ES) in support of the DCO application without requesting a Screening Opinion.

1.4 Requirement for a DCO

1.4.1 The Proposed Development is defined as an NSIP under sections 14(1)(a) and 15(1) and (2) of the Planning Act 2008, being an onshore generating station in England exceeding 50MW.

1.4.2 Regulation 8(1) of the EIA Regulations requires the Applicant to undertake one of the following steps before carrying out statutory consultation under Section 42 of the Planning Act 2008:

a) *"ask the Secretary of State to adopt a screening opinion in respect of the development to which the application relates; or*

b) *notify the Secretary of State in writing that the person proposes to provide an environmental statement in respect of that development."*

1.4.3 Following the completion of the surveys, assessments, and consultation processes outlined in this EIA Scoping Report, an application for a DCO will be made to the Secretary of State for determination in accordance with the Planning Act 2008. The DCO application will be accompanied by an ES, in accordance with Regulation 5(2)(a) of the Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009 ('APFP Regulations'). The ES will set out the methods and findings of a comprehensive EIA undertaken in line with the EIA Regulations.

1.5 Purpose of the report

1.5.1 Regulation 10(1) of the EIA Regulations sets out that "*A person who proposes to make an application for an order granting development consent may ask the Secretary of State to state in writing their opinion as to the scope, and level of detail, of the information to be provided in the environmental statement*".

1.5.2 In accordance with Regulation 10(1) of the EIA Regulations and the Planning Inspectorate's Advice Note Seven, this EIA Scoping Report has been

prepared with the purpose of ensuring that the subsequent EIA is focused on the key impacts likely to give rise to significant environmental effects, and to obtain agreement on the EIA approach and scope.

1.5.3 As well as identifying matters to be considered in the EIA, this EIA Scoping Report also identifies those matters that are not considered necessary to assess further and are proposed to be scoped out. This approach is in line with the general aim to undertake proportionate EIA, as advocated by industry best practice.

1.5.4 Whilst this EIA Scoping Report seeks to establish the overall framework for the EIA in relation to the environmental factors and associated effects, the exact scope of the EIA will be influenced by the Scoping Opinion received, the on-going design evolution of the Proposed Development, and through on-going baseline data collection (e.g., field surveys etc.). In this regard, a list of 'scoping questions' is presented within **Chapter 6** of this EIA Scoping Report, the aim of which is to assist the determining authority and its consultees in forming the Scoping Opinion.

1.5.5 **Table 1-1** sets out what information the EIA Regulations (Regulation 10(3)) state that a request for a scoping opinion must include and where this information can be found in this EIA Scoping Report.

1.5.6 **Table 1-2** sets out what information the Planning Inspectorate's Advice Note Seven recommends that a request for a scoping opinion should include and where this information can be found in this EIA Scoping Report.

Table 1-1 Information required by the EIA Regulations to accompany a request for a scoping opinion

Information Required	Location within this Report
A plan sufficient to identify the land	**Appendix A**
A description of the Proposed Development, including its location and technical capacity	**Chapter 2**
An explanation of the likely significant effects of the Proposed Development on the environment	**Chapter 6**
Such other information or representations as the person making the request may wish to provide or make	**Chapters 2 to 7**

Table 1-2 Information required by the Planning Inspectorate's Advice Note Seven to accompany a request for a scoping opinion

Information Suggested	Location within this Report
The Proposed Development	
An explanation of the approach to addressing uncertainty where it remains in relation to elements of the Proposed Development e.g. design parameters	**Chapters 2 and 3**
Referenced plans presented at an appropriate scale to convey clearly the information and all known features associated with the Proposed Development	**Appendices B and C**
EIA Approach and Topic Areas	
An outline of the reasonable alternatives considered and the reasons for selecting the preferred option	**Chapter 3**
A summary table depicting each of the aspects and matters that are requested to be scoped out allowing for quick identification of issues	**Chapters 5 and 6**
A detailed description of the aspects and matters proposed to be scoped out of further assessment with justification provided	**Chapters 5 and 6**
Results of desktop and baseline studies where available and where relevant to the decision to scope in or out aspects or matters	**Chapters 5 and 6**
Aspects and matters to be scoped in, the report should include details of the methods to be used to assess impacts and to determine significance of effect e.g. criteria for determining sensitivity and magnitude	**Chapter 4, Chapter 6 and Appendix D**
Any avoidance or mitigation measures proposed, how they may be secured and the anticipated residual effects	**Chapters 4, 5 and 6**
Information Sources and Guidance	
References to any guidance and best practice to be relied upon	**Chapters 4, 5, 6 and 7**

Information Suggested	Location within this Report
Evidence of agreements reached with consultation bodies (for example the statutory nature conservation bodies or local authorities)	**Chapter 6**
An outline of the structure of the proposed Environmental Statement	**Appendix E**

1.5.7 In accordance with Regulation 14(3)(a) of the EIA Regulations, the ES will be based on the scoping opinion adopted.

1.5.8 The outputs of the EIA will comprise:

- A Preliminary Environmental Information Report (PEIR), produced to inform the statutory consultation process, in accordance with the Planning Act 2008. The PEIR will present the understanding of the potential likely significant environmental effects at the time of the consultation and its purpose will be to provide information that enables interested parties, including members of the public, local authorities and statutory bodies, to understand those effects so that they can provide meaningful feedback; and
- The PEIR will be followed by the ES, which will be produced in support of the DCO application. The ES will report on a detailed assessment of the likely significant environmental effects resulting from the Proposed Development, to include taking account of the proposed mitigation measures.

1.6 References

Planning Act 2008. Available online: https://www.legislation.gov.uk/ukpga/2008/29/contents

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

Infrastructure Planning (Applications: Prescribed Forms and Procedure) Regulations 2009. Available online: https://www.legislation.gov.uk/uksi/2009/2264/contents/made

The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017. Available online: https://www.legislation.gov.uk/uksi/2017/572/contents/made

2 DESCRIPTION OF THE NATURE AND PURPOSE OF THE PROPOSED DEVELOPMENT

2.1 Introduction

2.1.1 This chapter provides a description of the Proposed Development for the purposes of identifying and reporting the potential environmental impact and likely significant environmental effects in this EIA Scoping Report. In addition, this chapter draws attention to the need for flexibility in the design process and provides a description of the Site.

2.1.2 The description of the Proposed Development represents the current understanding of the design parameters. However, as part of an ongoing design process, the detail provided in this chapter will be further refined for the PEIR. Following statutory consultation, further alteration to the description of the Proposed Development will be included in the ES which will confirm details for which development consent will be sought.

2.1.3 The construction and decommissioning methods to be utilised will be determined by the appointed contractor(s). However, all works will be required to be undertaken within the parameters assessed for the Proposed Development. With this in mind, the EIA will represent a 'worst case', ensuring a robust assessment of the likely significant environmental effects.

2.2 Approach to assessing uncertainty

2.2.1 In order to define the Proposed Development, determine where detail is to be included at DCO application stage, and where it may be deferred until after consent is granted, the Applicant will identify the level of flexibility to be embedded into the DCO application e.g., in relation to the solar PV modules or construction methods.

2.2.2 Many promoters of NSIPs seek flexibility in their consents given the long lead in times to consent and subsequent engagement of contractors. It is typical for a DCO to contain the ability to finalise the design of a scheme post-consent within set "limits of deviation" and/or parameters.

2.2.3 In order to maintain flexibility in the design, it is the Applicant's intention to use the 'Rochdale Envelope' approach within parameter ranges. The Planning Inspectorate's Advice Note Nine 'Rochdale Envelope' provides specific guidance to applicants on the degree of flexibility that could be considered appropriate under the Planning Act 2008 regime. The Advice Note acknowledges that there may be aspects of the design that are not yet fixed, and therefore, it may be necessary for the EIA to assess likely worst case

scenarios to ensure that all foreseeable significant environmental effects of the Proposed Development will be assessed.

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

2.2.5 Furthermore, such flexibility may be useful where a slight change in the design or capacity of the Proposed Development is anticipated, but not yet certain. Therefore, it may be possible that a particular element of the design will be subject to on-going technological advancements. It will be important that a lack of flexibility in the DCO application does not unduly hinder the Applicant's ability to consider and adopt such future technological advancements. This is of particular importance due to the rapid pace of change in solar PV and battery storage technologies.

2.2.6 It is therefore necessary for the EIA to assess an 'envelope' within which the works will take place. To remain in accordance with the EIA Regulations, it will be essential that the parameters are defined to ensure that 'likely significant environmental effects' are identified, rather than unrealistically amplified effects, which could be deemed unlikely. These parameters will be considered in detail by the competent experts in the PEIR and ES to ensure the realistic 'worst case' effects of the Proposed Development are assessed for each potential receptor.

2.2.7 Further detail on draft design approach that is being used to inform the EIA is presented in **Section 2.5**. Design parameters will be further developed for statutory consultation and presented in the PEIR. Parameters and limits of deviation will be presented in the ES, draft DCO and works plans.

2.3 Need for the Proposed Development

2.3.1 Low carbon solar generation is an essential step to meeting the Government's objectives to enable decarbonisation. Draft Overarching National Policy Statement for Energy (EN-1), published in 2023, states that *"a secure, reliable, affordable, net zero consistent system in 2050 is likely to be composed predominantly of wind and solar"*.

2.3.2 The Proposed Development seeks to contribute towards the significant capacity of low-carbon solar generation that is urgently needed in the UK. The Proposed Development will contribute towards the achievement of

government net zero targets and a UK energy supply that is secure, low carbon and low cost.

2.4 Proposed Development location

2.4.1 The Site comprises Solar PV module areas and cable corridors located within the administrative boundary of East Riding of Yorkshire Council.

2.4.2 The Solar PV module areas measure approximately 845 hectares (ha) and extend across six distinct Land Areas (A-F), which will be connected by a series of underground cables. The Proposed Development will connect to the existing National Grid substation at Creyke Beck, located approximately 5.6 km south-west of the southern extent of the Site by underground cabling. The Site boundary and six Land Areas are presented in **Appendix C**. The Land Areas are identified as follows:

- Land Area A: Land south of High and Low Baswick;
- Land Area B: Land north-west of Long Riston;
- Land Area C: Land west of Arnold;
- Land Area D: Land south of the A1035;
- Land Area E: Land east of Weel; and
- Land Area F: Land north of Wawne.

2.4.3 A number of cable corridor options are currently included within the Site (see **Appendix C**). The land under consideration for cable corridor options measures approximately 626 ha. As the design progresses, only a single cable corridor will be required to connect the Solar PV module areas via a 132 kV cable to the Creyke Beck Substation and the maximum width of the cable corridor will be 50 m. The exact route of this cable route is yet to be determined, but part of it could be located within the administrative area of Hull City Council.

2.4.4 The expected area of land potentially required for the construction, operation, maintenance and decommissioning of the Proposed Development, which includes land required for permanent and temporary purposes, is shown in **Appendix A**. It is important to note that this will be subject to change as the design and EIA progress; however, **Appendix A** shows the envisaged current maximum extent of temporary and permanent land usage for the Proposed Development.

2.4.5 Together with the description of the Proposed Development set out in **Section 2.5**, **Appendix A** represents the current maximum land expected to be required for the Solar PV module areas and all possible cable corridor options that could form part of the Proposed Development. This allows for consideration of the potential environmental effects of the full range of options under consideration, to ensure that the likely significant environmental effects of each of the options has been scoped into further assessment.

2.4.6 At this stage of the process, there is no known existing infrastructure within the Site that will need to be removed as part of the Proposed Development.

Site location

2.4.7 The most northern part of the Site is located north-west of Leven, with the remainder of the Site located on land between the villages of Tickton, Riston, Wawne, Weel, and Woodmansey.

2.4.8 The land within the Site boundary predominantly consists of agricultural fields (mostly arable with some grassland) interspersed with hedgerows, ditches, small woodland blocks and farm access tracks. The hedgerows within the Site range from dense tall vegetation (shrub and tree species) to thin lines of vegetation with sporadic shrubs and trees present. The fields are bordered by a mix of hedgerows, wet ditches and some of the many major named drains and dikes in the area.

2.4.9 There is some variation in the features immediately surrounding each of the Land Areas within the Site, as presented below. **Appendix B** contains an 'Environmental and Planning Features' plan, which displays some of these features.

- **Land Area A: Land south of High and Low Baswick.** This is the northernmost section of the Site and is the only Land Area to lie north of the A1035. It is bounded to the west and partly to the north by the River Hull, and to the south-east by Beverley Airfield. In other directions lie relatively open agricultural fields.
- **Land Area B: Land north-west of Long Riston.** This area comprises two separate sections. One lies west of the A165 and is bounded to the north by the A1035, to the west by Meaux and Routh East Drain, to the east by an unnamed ditch, and to the south by Land Area C. Monk Dike runs through the centre of this section. The other smaller section of Land Area B lies east of the A165 and north of Long Riston, and is bounded by agricultural fields and ditches.
- **Land Area C: Land west of Arnold.** This area lies adjacent to the southern boundary of Land Area B. It is bounded to the west by Arnold West Carr Drain/Arnold and Riston Drain, and to the south by Kidhill Lane. Along the eastern boundary are ditches and agricultural land.
- **Land Area D: Land south of the A1035.** This area is located in the centre of the overall Site. It is adjacent to Land Area E which lies to the south-west. The area is bounded by various drains and ditches and crosses Meaux Lane. On the eastern border is Cote Wood Local Wildlife Site (LWS) and semi-natural ancient woodland. Meaux Abbey Scheduled Monument lies to the south.
- **Land Area E: Land east of Weel.** This area comprises three separate sections. The westernmost of these, located approximately 300 m east of Weel at the closest point, lies either side of Carr Lane and is bounded by ditches and agricultural land. The largest section of Land Area E is

primarily bounded to the west and south by Holderness Drain, to the east by Meaux West ditch, and to the north-east by Land Area D. To the north is agricultural land, within which is Meaux duck decoy Scheduled Monument. Beyond this is the third section of Land Area E, which is divided in two by a strip of woodland. Meaux Abbey Scheduled Monument lies to the south-east of Land Area E.

- **Land Area F: Land north of Wawne.** This is the southernmost Land Area, lying approximately 730 m north-east of Wawne at the closest point. It is largely bounded to the north and east by Holderness Drain. In other directions are agricultural fields. To the north, beyond Holderness Drain, is Meaux Abbey Scheduled Monument. Meaux Road runs north to south through this Land Area.

2.4.10 The area between each of the Land Areas within the Site is being investigated for the incorporation of underground cabling routes, access routes and temporary construction compounds for the Proposed Development. The locations of these elements will be defined as the project design progresses. To connect the Proposed Development to Creyke Beck Substation, underground cable routes running from either Land Area E or Land Area F are being investigated and one of these will be selected and defined as the project design progresses.

Water resources

2.4.11 There are five watercourses within or in close proximity to the Site that are shown as Main Rivers on Environment Agency mapping:

- The River Hull, which runs through the western part of the Site, close to the border of Land Area A;
- Holderness Drain, which runs beside Land Area A and across the centre of the Site;
- Monk Dike, which runs through Land Area B and beside Land Area C;
- Meaux and Routh East Drain, which runs beside Land Area B and Land Area C; and
- The Beverley and Barmston Drain, which runs to the west of the River Hull.

2.4.12 The Site occupies predominantly low-lying land which relies on a network of drainage systems including ditches, culverts and pumping stations.

2.4.13 Large parts of the Site fall within Flood Zones 2 and 3 based on the Environment Agency's flood map for planning. Flood Zone 3 indicates an area that has a high probability of flooding, defined as a 1% or greater annual probability of river or sea flooding. Flood Zone 2 is defined as having between a 0.1% and 1% annual probability of river or sea flooding.

Access and recreation

2.4.14 The A1035 leads north-east from Beverley and runs adjacent to the northern boundary of Land Area B. Land Area A sits to the north of the A1035, while the rest of the Site is to the south. The A165 joins the A1035 and runs south to the city of Hull, splitting the two sections of Land Area B.

2.4.15 Meaux Lane/Meaux Road runs through the centre of the Site, through Land Areas D and E, and there are several smaller lanes and farm tracks across the rest of the Site.

2.4.16 The public rights of way (PRoW) identified below and displayed in **Appendix B** lie within, adjacent to or intersect the Site:

- Leven Footpath No.6 (LEVEF06) runs alongside the River Hull to the west of Land Area A;
- Tickton Bridleway No.5 (TICKB05) runs along the eastern border of the westernmost section of Land Area E;
- Tickton Footpath No.6 (TICKF06) runs to the west of Land Area E;
- Leven Footpath No.5 (LEVEF05) runs for a short distance alongside Monk Dike through the centre of the northern part of Land Area B (and connects to Riston Footpath No.2);
- Riston Footpath No.2 (RISTF02) runs alongside Monk Dike through the centre of Land Area B and along the western boundary of Land Area C (and connects to Leven Footpath No.5);
- Riston Footpath No.1 (RISTF01) runs across the southern part of Land Area C;
- Swine Footpath No.7 (SWINF07) runs from the southern boundary of Land Area C; and
- Wawne Footpath No.1 (WAWNF01) intersects the southern tip of Land Area F.

Ecology and biodiversity

2.4.17 No statutory ecological designations lie within the Site.

2.4.18 There are five international statutory designations covering three sites within 10 km of the Site boundary:

- Hornsea Mere Special Protection Areas (SPA) (5.8 km east);
- Humber Estuary Ramsar/SPA/Special Area of Conservation (SAC) (9.3 km south); and
- Greater Wash SPA (9.6 km east).

2.4.19 There are two statutory nationally designated sites within 2 km of the Site boundary:

- Tophill Low Site of Special Scientific Interest (SSSI) (365 m north of Land Area A); and
- Leven Canal SSSI (865 m south of Land Area A).

2.4.20 There are seven non-statutory designated sites (Local Wildlife Sites (LWS)) within 1 km of the Site boundary, including Cote Wood LWS, which borders Land Area D (see **Appendix F**).

2.4.21 There is one area of ancient semi-natural woodland within 1 km of the Site boundary, namely Cote Wood LWS, which borders the Site boundary to the east of Land Area D.

2.4.22 Other priority habitats which are within or adjacent to the Site include areas of priority deciduous woodland (in the central and western sections of the Site) and areas of floodplain grazing marsh (to the south-west of the Site).

Landscape

2.4.23 The Site is not covered by any statutory landscape designations, nor are there any within 3 km of the Site. The nearest Areas of Outstanding Natural Beauty (AONB) to the Site are the Lincolnshire Wolds AONB and Howardian Hills AONB, both of which are over 30 km from the Site.

2.4.24 There are no Registered Parks and Gardens within 3 km of the Site; the nearest ones are over 6 km away to the south-west and south-east.

2.4.25 The Site is located in the centre of National Character Area (NCA) 40 Holderness.

Geology

2.4.26 Bedrock geology across the Site is recorded as chalk (Flamborough Chalk Formation).

2.4.27 The superficial geological units within the Site include alluvium, till, sand and gravel, and tidal flat deposits.

2.4.28 The bedrock deposits underlying the Site form a principal aquifer, with superficial geological units defined as secondary A aquifers or secondary aquifers (undifferentiated).

2.4.29 A large zone I Source Protection Zone, with respect to a groundwater abstraction source, is present close to Cottingham, with large sections of the Site being within the zone I (inner protection zone), zone II (outer protection zone) and zone III (total catchment) sections of the Source Protection Zone.

Cultural heritage

2.4.30 There is one designated asset located within the Site boundary, a Grade II listed Kiosk No. 8 (K8) telephone kiosk.

2.4.31 Beyond the Site boundary there are 17 Scheduled Monuments within 3 km of the Site. Among these are the following, which both border the Site boundary (see **Appendix B**):

- The site of Meaux Cistercian Abbey; and
- Meaux duck decoy.

2.4.32 The following are also present within 3 km of the Site:

- 12 Grade I, 37 Grade II* and 440 Grade II Listed Buildings;
- One Grade II Registered Park and Garden; and
- 14 Conservation Areas.

2.4.33 There are no Registered Battlefields or World Heritage Sites within 3 km of the Site.

Existing infrastructure

2.4.34 A desk-based search of utilities within the Site has identified the presence of several assets in the area, including high pressure gas mains, telecoms cables and electrical cables. In addition, water and sewer utilities are present. The locations of existing utilities will be considered in the ongoing design development.

2.5 Description of the Proposed Development

2.5.1 The Proposed Development will include the following key components:

- Solar PV modules and associated mounting structures;
- On-site supporting equipment including inverters, transformers, and switchgears;
- Battery Energy Storage System (BESS);
- Two on-site substations to connect the solar PV module areas to the National Grid;
- 33 kV underground cabling within the areas of the solar PV modules and to connect the solar PV module areas to the two on-site substations;
- 132 kV underground cable connecting the two on-site substations to the National Grid substation at Creyke Beck;
- Modifications to existing equipment within the National Grid substation at Creyke Beck;

- Associated infrastructure including access tracks, parking, security measures, gates and fencing, lighting, drainage infrastructure, and storage containers;
- Environmental mitigation and enhancement measures; and
- Temporary development during the construction phase including construction compounds, parking and temporary access roadways.

2.5.2 Works to understand the highway effects of the Proposed Development are ongoing and there may be the need for additional minor highway widening or adjustments in limited parts of the public highway in the vicinity of the Site to facilitate access during construction. These would be identified, if required, at the statutory consultation stage.

2.5.3 **Table 2-1** below provides the anticipated parameters of the elements in **paragraph 2.5.1**.

Table 2-1 Anticipated parameters

Proposed Development Element	Anticipated Parameters (physical or otherwise)
Solar modules – Trackers or Fixed	Height: 3.5 m
Hybrid pack (inverter/ transformer/BESS)	Height: 3 m Length: 12.5 m Width: 2.5 m Typically arranged in row of three-four (so max. footprint is 54 m long by 2.5 m wide)
Switchgear	Height: 3 m Length: 12.5 m Width: 2.5 m
Site fencing (post and wire)	Height: 2 m
CCTV poles	Height: 3 m
Access gates	Height: 2 m Width: 5 m
Internal roads	Width: 4 m
Interconnecting cables – 33 kV	Width: 1.2 m Depth: 1.6 m
Two on-site substations	Height (comms. tower): 15 m Height (electrical equipment): 8 m Length: 70 m

Proposed Development Element	Anticipated Parameters (physical or otherwise)
	Width: 70 m
Grid connection cable route working width	Width: 50 m total Depth: 1.2 m

2.5.4 Each of the elements outlined above and their associated key features are set out in the following sections.

Solar photovoltaic (PV) modules and associated mounting structures

2.5.5 Solar panels generate electrical power by using a solar PV module to convert sun light into direct current (DC) electricity. Individual solar PV modules, more commonly known as solar panels, contain several PV cells wired and encapsulated by tempered glass. Solar PV modules are sealed for weatherproofing and held together by a metal frame in a mountable unit.

2.5.6 Individual solar PV modules are typically 2 m by 1 m in width and depth and can vary in height. However, as solar PV modules are rapidly developing due to innovation in technology and processing techniques for the PV cells, the dimensions of the solar PV modules available at the time of construction may vary. The ES will therefore consider a height parameter which represents the worst-case scenario in terms of identifying likely significant environmental effects.

2.5.7 Solar PV modules are fixed to mounting structures in groups known as 'strings'. The exact number and arrangement of modules depends on a range of factors including the size of the system, its location, and the direction in which the solar panels are installed. As technology and equipment are evolving, some flexibility in design will be required to accommodate technology advances.

2.5.8 The solar PV modules will be installed either as fixed arrays or as tracking arrays (which adjust the position of the solar PV modules to track the sun throughout the day). **Table 2-2** provides an overview of the anticipated parameters of each type of panel module.

Table 2-2 Overview of types of solar PV modules

Type or solar PV module	Fixed	Tracking
Description	Rows of Solar PV modules aligned in east-west rows with panels facing South	Rows of Solar PV modules mounted on a metal tracking system aligned in north-south rows with panels rotating east-west

Type or solar PV module	Fixed	Tracking
Angle	+/- 10° to 30°	+/- 60°
Orientation	South	East-west
Separation distance	Approximately 4-12 m between rows	Approximately 4-6 m between rows
Height[1]	• Maximum height of up to 3.5 m • Minimum height of the lowest part of the panel would typically be between 0.8 m	• Maximum height of 3.5 m, which would vary throughout the day • Minimum height of the lowest part of the panel would typically be 0.8m
Mounting Structure	The mounting structure for the solar PV modules is a metal frame (usually anodised aluminium alloy) securely fixed to the ground and supported by galvanized steel poles which are typically driven into the ground to a depth of approximately 1 m. Where the assessment has identified the need for archaeological protection, alternative mounting structure designs will be considered	

On-site supporting equipment

2.5.9 A range of equipment is required to support the solar PV modules in order to convert the power generated, manage this power and export power onto the National Grid. The electrical output from the solar PV modules would be exported by low voltage cabling to shipping container style storage units which would contain an inverter, transformer and battery system. The function of each of these elements are as follows:

- Inverters convert the direct current (DC) generated by the solar PV modules into alternating current (AC) that can be exported to the National Grid;
- Transformers monitor, increase and control the voltage of the electricity produced before it reaches the two on-site substations. The transformers would be located adjacent to the inverters; and
- The BESS would comprise containerised battery storage systems, DC-DC converter boxes and ancillary equipment.

2.5.10 The inverters, transformers and BESS would be arranged together across the Site and housed in shipping-style containers. At this stage, it is anticipated that there would be an approximate combination of up to 70 hybrid containers (which include an inverter and BESS) and up to 58 inverter-only containers located across the Proposed Development, placed on a gravel pad foundation,

[1] The maximum and minimum height dimensions are indicative at this stage as the final elevation of the solar PV modules will be influenced by design factors such as local topography, configuration and mitigation proposals.

and measuring approximately 3 m in height, 2.5 m in width and 12.5 m in length.

2.5.11 The Proposed Development would utilise up to five switchgears to control, protect and isolate electrical currents and equipment. Switchgears allow parts of the solar PV system to be de-energised safely, allowing routine maintenance or faults to be identified and work undertaken. It is anticipated that the switchgears would be housed in shipping-style containers.

2.5.12 Each Land Area (A to F) would also contain a communications and weather mast, which would be up to 5 m in height.

Battery Energy Storage System (BESS)

2.5.13 The Proposed Development would include BESS, which is likely to consist of lithium-ion batteries housed in shipping container-style structures. The ability to store energy on-site is required to store surplus electricity produced and provide grid balancing services by allowing excess electricity generated from the solar PV modules to be stored and dispatched as required. The BESS may also be capable of importing electricity from the National Grid to store electricity in order to export this electricity to the National Grid at peak times.

2.5.14 The facility would require associated heating, ventilation and cooling (HVAC) systems to ensure efficiency of the batteries and these systems would be integrated within the individual containers.

2.5.15 The BESS will be DC-DC coupled, meaning they would be dispersed across the Site. A typical BESS unit measures approximately 3.2 m in height, 2.4 m in width and 6m m in length.

On-site substations

2.5.16 Two on-site substations would be required for the Proposed Development to connect the solar PV module areas to distribution and transmission networks. The substations would also house other electrical equipment such as transformers, switchgear and metering equipment.

2.5.17 The purpose of the on-site substations is to convert low voltages from electricity generation to high voltages, or vice versa, using power transformers.

2.5.18 Two on-site substations will be located within the Site, the locations of which are still to be determined but will be within Land Areas B, C or D.

2.5.19 The on-site substations will be sized as 200 megavolt-amperes (MVA). The substation compounds would be up to 70 m in length and 70 m in width. The equipment within would have a maximum height of 15 m (which would only

relate to a communications tower, with the maximum height of the other equipment within the substation being 8 m).

Underground cabling

2.5.20 Underground cables would be required to connect the solar PV modules to the on-site transformers, switchgear, and BESS, as well as from the Land Areas to the two on-site substations, and onwards to the National Grid substation at Creyke Beck.

Underground cabling between the land areas

2.5.21 Low voltage cabling within the Land Areas would be required to connect solar PV modules and the BESS to inverters where the voltage is transformed from the lower voltage to 33 kV. Cabling from the solar PV modules to the inverters would typically be installed above ground and fixed to the mounting structure of the modules, with a small section placed underground where it leaves the modules and connects to the inverters.

2.5.22 Higher voltage cables (33 kV) are required to connect the inverters and switchgears, and to connect the switchgears to the two on-site substations. These cables would be buried underground. The dimensions of the trenches vary depending on the number of cables or ducts they contain, but could be typically up to 1.2 m in width and up to 1.6 m in depth.

2.5.23 Data cables (typically fibre optic) would be installed, typically alongside electrical cables in order to allow for monitoring during operation and maintenance, such as the collection of solar data from devices known as pyranometers.

2.5.24 At this stage, it is anticipated that underground cables would be installed using a cable plough, wherever possible. This is considered to be the most efficient and least impactful method of cable installation, causing minimal disruption to the ground by cutting, installing and back-filling in one operation.

2.5.25 In instances where the cable plough cannot be used, for example when crossing a public road, alternative methods, such as horizontal directional drilling (HDD), would be considered and assessed within the PEIR and ES.

Underground cabling to National Grid substation at Creyke Beck

2.5.26 The Proposed Development would connect to the existing National Grid substation at Creyke Beck, located approximately 5.6 km south-west of the southern extent of the Site by underground cabling.

2.5.27 The underground cabling would comprise of 132 kV cable. The maximum dimension of the cable trench required to install the cabling would be 1.6 m deep by 2 m wide.

2.5.28 It is anticipated that a cable plough would be used to install the 132 kV cables, but it is likely that some HDD would be required in more constrained locations. The method of cable installation will be fully assessed as part of the ES.

2.5.29 The current Grid Connection Route Options as shown in **Appendix C** is for scoping purposes and will be refined further prior to statutory consultation based on the findings of detailed engineering works, EIA studies and other relevant investigations. The Highfield House Scheduled Monument is excluded from the Grid Connection Route Options to avoid direct impacts as far as possible (see **Appendix B**). Whilst there are residential properties and settlements shown within the Grid Connection Route Options, no cables will be installed under residential properties or within residential gardens. The public highway within these areas is being considered as part of the ongoing cable route investigations.

2.5.30 The Grid Connection Route Options will be refined for the PEIR and ES, before the submission of the DCO application, and will be designed to avoid as far as possible sensitive receptors such as habitat designations, water features, residential and commercial properties and archaeology features.

Modifications/connections to National Grid

2.5.31 The full extent of the works to connect to the National Grid are still to be finalised and are anticipated to be undertaken by Northern Power Grid (the District Network Operator) as part of the grid connection agreement. The works are minor in nature and are likely to comprise of the replacement or upgrading of existing electrical equipment within the existing Creyke Beck Substation footprint.

Other infrastructure

2.5.32 Additional infrastructure would be required to support the operation of the Proposed Development. The following equipment is expected to be installed across the Site:

- Fencing and gates – A perimeter security fence would be installed to enclose the operational areas of the Proposed Development. The fence is likely to be either a wire-mesh or deer fence (if required) and to measure approximately 2 m in height. The fence would be designed in such a way to allow small animals to pass through the Site and would also be gated to allow access to and from the Site.
- CCTV – Pole-mounted, infrared security detection cameras would be mounted on poles of approximately 3 m in height located within the perimeter fence. It is anticipated that these cameras would have motion detection technology for recording, and would be pointed directly within the Site and away from any land outside of the Site;
- Lighting – In general, it is anticipated that the Proposed Development would not be lit; however, infrared security lighting would be required

around key electrical infrastructure. This lighting would be sensor triggered and therefore not continuous;

- Internal access tracks – Access to and within the Proposed Development during operation would be required for maintenance. A series of access tracks are proposed within the Site;
- Drainage – The detailed operational drainage design for the Proposed Development will be undertaken prior to construction. The overarching principle of the drainage strategy for the Proposed Development is to provide Sustainable Drainage Systems (SuDS) at source, ensuring that surface water run-off mimics existing site conditions as far as is reasonably practicable;
- The design of new drainage systems would be based on the Flood Risk Assessment (FRA) and hydrological assessment to be undertaken in support of the DCO application. If feasible or relevant, infiltration drainage design would be in accordance with Building Research Establishment (BRE) Digest 365: Soakaway Design (2016). Otherwise, an attenuation system with restricted discharge to existing watercourses will be proposed. Other than discharge pipes, drainage infrastructure being placed at least 10 m away from watercourses; and
- Storage containers – It is anticipated that nine additional storage containers would be installed on-site to contain extra equipment to support maintenance activities.

Landscaping and biodiversity mitigation and enhancements

2.5.33 The Proposed Development would incorporate field boundary enhancement, including new hedgerows, and planting of meadow grass and wildflower seed mixes within the Site. Planting would also be used to soften and screen views of the Proposed Development where feasible. The enhancements and planting would increase biodiversity within the Site and contribute to the Proposed Development achieving Biodiversity Net Gain (BNG) in accordance with the requirements of the Environment Act 2021, the National Planning Policy Framework (2023), Draft NPS EN-1 (2023) and local planning policy. It is anticipated that BNG could be achieved within the Site boundary, but if not possible, off-site solutions would be considered.

2.5.34 Although the requirement for a minimum 10% gain in biodiversity will not become mandatory for NSIPs until 2025, in line with best practice the Proposed Development design will aim to achieve BNG levels greater than the minimum 10% set out in the Environment Act 2021. It is noted that similar solar schemes developed by the Applicant have typically delivered BNG well in excess of this figure.

2.6 Construction phase

Construction programme

2.6.1 Subject to development consent being granted, the earliest construction could start is in 2026. Operation in 2028 is the earliest date that the Proposed Development could be connected to the National Grid.

2.6.2 Construction would require an estimated 24 months, with peak construction activity anticipated during 2027. This assumes commencement of construction in early 2026, with completion by early 2028 (anticipated 24month construction period).

2.6.3 The PEIR and ES will provide further details of the proposed construction activities, including their anticipated duration and an indicative programme of each phase of the construction work.

Construction traffic and site access

2.6.4 Based on the preliminary construction material and equipment requirements, it is anticipated that there could be up to a total 70-80 heavy goods vehicle (HGV) movements per day for the Solar PV module areas and approximately 10 HGV movements per day for the underground cabling during the peak construction period. This number is indicative, excludes construction staff transportation and ancillary construction traffic, and is subject to refinement. A reasonable worst case scenario will be presented and assessed in the PEIR and ES.

2.6.5 Construction access to the Site is yet to be finalised. A number of indicative construction access points to the Site from the public highway have been identified in **Appendix C**.

2.6.6 All final construction accesses will be confirmed as the Proposed Development design progresses and in consultation with the relevant stakeholders and authorities, including landowners and East Riding of Yorkshire Council as the Local Highway Authority.

2.6.7 It is anticipated that the existing local roads would be utilised to access the Site, subject to the suitability of these roads to carry HGVs. Many of the roads around the Site are currently accessible by farm machinery and agriculture-related HGVs. The need for road upgrades, widening and new road construction, for example for abnormal loads or to ensure visibility splays at Site access/egress points, will be determined as the Proposed Development design develops, and assessed as appropriate in the PEIR and ES.

2.6.8 An Outline Construction Traffic Management Plan will be developed and submitted in support of the DCO application.

Construction compounds

2.6.9 Construction compound locations are yet to be identified, though it is anticipated that at least one compound will be located within each of the six Solar PV module areas.

2.6.10 Compounds are expected to measure approximately 60 m in length and 60 m in width. A 'Durabase Mat System' or a similar non-ground penetrating mat system would be used within the compounds.

2.6.11 The temporary construction compounds would typically contain construction worker welfare facilities, a site office, limited parking, wheel wash area, plant and machinery storage, HGV/delivery turning area and waste storage areas.

2.6.12 For security and safety purposes, any live construction areas would be closed to the public throughout the construction phase. Site security staff would patrol the Site, in addition to hazard warning signs and CCTV.

Preparatory works

2.6.13 Preparatory works would be the first phase of construction and include activities to enable and prepare the Site for the construction of the Proposed Development. At this stage in design, it is anticipated that works undertaken during this phase are likely to include:

- Establishment of and/or works to Site access point(s);
- Installation of any temporary/permanent culverts under watercourses/ditches;
- Site clearance activities such as stripping of topsoil, trenching (if required), storage and capping of soil;
- Construction of any access tracks and laydown areas with the Site;
- Establishment of construction compounds;
- Establishment of mobilisation areas, running tracks and temporary construction compounds for cable installation;
- Erection of security fencing around the Site perimeter, as well as access gates;
- Installation of security measures such as CCTV;
- Delivery of plant and machinery to the Site; and
- Delivery of materials to enable first phases of construction.

2.6.14 There are multiple utilities crossing the Site, including high pressure gas mains, water pipes, telecoms cables, electrical cables and drainage. Prior to construction, the design team and principal contractor will review the utilities plans and use them to inform the plans for the proposed works to ensure all known utilities are avoided. Necessary offsets to known assets have been taken into account within the current design.

Construction of the Proposed Development

2.6.15 Following the preparatory works, construction of the Proposed Development would commence. The PEIR and ES will provide further details of the proposed construction activities, their anticipated duration, along with an indicative programme for construction.

2.6.16 At this stage in design development, it is anticipated that the following types of construction activities may be required:

- Solar PV module installation;
- Installation of solar PV module support structures;
- Mounting of solar PV modules;
- Installation of supporting infrastructure, such as inverters, transformers, battery stations and switchgear;
- Installation of the BESS;
- Construction of the two on-site substations;
- Installation of storage containers;
- Cable installation;
- Installation of construction drainage with pumping (if required);
- Installation of cabling across the solar PV module areas and connection to the inverters; and
- Installation of cables between inverter platforms, transfer stations and collecting stations and onto the point of connection and the National Grid substation at Creyke Beck.

Cable installation

2.6.17 The following activities would be required to install the underground cables:

- Site preparation;
- Temporary construction compounds;
- Stripping of topsoil in sections;
- Trenching and installation of electric cabling;
- Cable joint installation;
- Implementation of crossing methodologies for watercourses, roads and railway (e.g. HDD, cable bridging etc); and
- Reinstatement works where necessary.

Construction environmental management

2.6.18 An Outline Construction Environmental Management Plan will be submitted in support of the DCO application which will describe the framework of mitigation measures identified in the ES to be followed and to be carried forward to a detailed Construction Environmental Management Plan prior to the

construction of the Proposed Development. The aim of the Construction Environmental Management Plan is to reduce nuisance impacts from:

- Use of land for temporary laydown areas, accommodation etc.;
- Construction traffic (including parking and access requirements) and changes to access and temporary road or footpath closure (if required);
- Noise and vibration;
- Construction lighting;
- Utilities diversion;
- Dust generation;
- Handling of soil resources;
- Run off and drainage; and
- Waste generation.

2.6.19 The detailed Construction Environmental Management Plan would be produced by the appointed principal contractor and agreed with East Riding of Yorkshire Council following grant of the DCO and prior to the start of construction (secured by a DCO requirement). This would identify the procedures to be adhered to and managed by the principal contractor throughout construction, and would be informed by the Outline Construction Environmental Management Plan.

2.6.20 Contracts with companies involved in the construction works would incorporate environmental control, health and safety regulations, and current guidance and ensure that construction activities are appropriately controlled and that all appointed construction contractors involved in the construction of the Proposed Development are committed to agreed best practice and meet all relevant environmental legislation including:

- Control of Pollution Act 1974;
- Environment Act 2021;
- Hazardous Waste Regulations 2005 (as amended); and
- Waste (England and Wales) Regulations 2011.

Commissioning

2.6.21 Following construction, the Proposed Development would go through a stage of testing prior to being commissioned and the first electricity generated and supplied to the National Grid. This is likely to involve mechanical and visual inspection of the Proposed Development, as well as electrical and equipment testing.

Site reinstatement and habitat creation

2.6.22 The management of the landscape and ecological features will be undertaken in accordance with a Landscape and Ecological Management Plan that will be secured via a DCO requirement.

2.6.23 An Outline Landscape and Ecological Management Plan will be submitted in support of the DCO application. The Outline Landscape and Ecological Management Plan will outline mitigation and enhancement that support BNG. A detailed Landscape and Ecological Management Plan would be produced following grant of the DCO and prior to the start of construction (secured by a DCO requirement), and would be in accordance with the Outline Landscape and Ecological Management Plan.

2.7 Operational phase

2.7.1 The design life of the Proposed Development is expected to be up to 40 years.

2.7.2 During the operational phase of the Proposed Development, on-site activities would be limited and restricted to maintenance activities and grazing. It is assumed that inspections will be carried out and access will use the previously built construction roads and/or access points. Maintenance activities are likely to include:

- Regular visual inspection of all infrastructure;
- Regular scheduled inspections and testing of equipment;
- Replacement of consumable items (e.g., inverter filters);
- Cleaning of solar PV modules, if required;
- Repair or replacement of solar modules or other components, if damaged;
- Delivery of spare parts, replacement equipment items and consumables;
- Water management (e.g., clearing of drainage ditches); and
- Vegetation management (e.g., cut back of grass, hedges, trees).

2.7.3 The Land Areas would be surrounded by a 2 m high security fence. In addition, the Proposed Development would be monitored with pole-mounted CCTV cameras along the perimeter fencing.

2.7.4 Operational access to the Site will be determined as the Proposed Development design progresses and in consultation with the relevant authorities and stakeholders, including landowners and East Riding of Yorkshire Council as the Local Highway Authority.

Operational environmental management

2.7.5 An Outline Operational Environmental Management Plan will be submitted in support of the DCO application, which will set out the principles and key measures that will be employed during the operation of the Proposed Development to control and minimise impacts on the environment.

Soils management

2.7.6 An Outline Soil Management Plan will be prepared and submitted in support of the DCO application. The Outline Soil Management Plan will follow the principles of best practice to maintain the physical properties of the soil, with the aim of restoring the land to its pre-construction condition at the end of the lifetime of the Proposed Development.

Landscape and ecology management

2.7.7 A programme of landscape and ecology establishment will be carried out. An Outline Landscape and Ecological Management Plan will be submitted in support of the DCO application, which will set out the principles for how the land will be managed throughout the operational phase, following the completion of construction.

2.7.8 A detailed Landscape and Ecological Management Plan will be produced following consent and prior to the start of construction, which will be secured by a DCO requirement.

Public rights of way

2.7.9 In accordance with Section 55 Acceptance of Applications Checklist (version June 2022), the DCO application will be supported by a plan identifying any proposed new or altered means of access, stopping up of streets or roads or any diversions, extinguishments or creation of rights of way or public rights of navigation. An Outline Public Rights of Way Management Plan will also be submitted in support of the DCO application.

2.7.10 The Outline Public Rights of Way Management Plan will include a schedule of public rights of way within the Site and outline the proposed measures to manage any requirements to temporarily ‘stop up’ public rights of way within the Site during construction with a suitable diversion in place.

Battery safety

2.7.11 An Outline Battery Safety Management Plan will be prepared and submitted in support of the DCO application. The Outline Battery Safety Management Plan will detail the regulatory guidance reviewed to ensure that all safety concerns around the BESS element are addressed in so far as is reasonably practicable.

2.8 Decommissioning phase

2.8.1 As previously outlined, the design life of the Proposed Development is expected to be up to 40 years.

2.8.2 Following operation, the Proposed Development would require decommissioning. The process of decommissioning would involve the removal of all solar infrastructure, including the solar PV modules and on-site supporting equipment, from the Site to be recycled or disposed of in accordance with industry best practices at that time. Any requirements to leave certain infrastructure, for example access tracks, would be discussed and agreed with landowners as part of the decommissioning process. It is anticipated at this stage that underground cabling would be left in situ to avoid unnecessary ground disturbance.

2.8.3 The Site would be returned to its original use as far as possible and practical, with areas of established mitigation left in-situ where possible and in agreement with the landowners.

2.8.4 The use of decommissioned materials would follow the waste hierarchy such that they would be reused where possible before recycling and disposal were considered. Up to 99% of materials in a solar PV module are recyclable, with organisations around the UK specialising in solar panel recycling in line with the Waste Electrical and Electrical Equipment Regulations 2021.

2.8.5 Decommissioning is expected to take between 6 to 12 months and could be undertaken in phases.

2.8.6 At the time that decommissioning would take place, the regulatory framework, good industry practices and the future baseline could have altered. An Outline Decommissioning Environmental Management Plan, which will set out the general principles to be followed in the decommissioning of the Proposed Development, will also be submitted in support of the DCO application. These measures, commitments and actions would be carried forward to a detailed Decommissioning Environmental Management Plan, taking account of good industry practice, its obligations to landowners under the relevant agreements and all relevant statutory requirements.

2.8.7 It is expected that the Outline Decommissioning Environmental Management Plan would likely include details regarding:

- Arboricultural management
- Traffic management
- Materials management
- Waste management.

2.8.8 The detailed Decommissioning Environmental Management Plan would be prepared at the time of decommissioning, in advance of the commencement

of decommissioning works and would include timescales and methods for transportation of materials. It is expected that this would be secured through a DCO requirement.

2.9 References

Advice Note Nine: Rochdale Envelope 2018. Planning Inspectorate. Available online: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-nine-rochdale-envelope/

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Environment Agency Flood Map for Planning. Available online: https://flood-map-for-planning.service.gov.uk/

National Planning Policy Framework (2023). Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf

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The Hazardous Waste (England and Wales) Regulations 2005 (as amended). Available online: https://www.legislation.gov.uk/uksi/2005/894/contents/made

The Waste (England and Wales) Regulations 2011. Available online: https://www.legislation.gov.uk/uksi/2011/988/contents/made

Waste Electrical and Electronic Equipment Regulations 2021. Available online: https://www.gov.uk/guidance/regulations-waste-electrical-and-electronic-equipment

3 REASONABLE ALTERNATIVES CONSIDERED

3.1 Introduction

3.1.1 Regulation 14(2)(d) of the EIA Regulations states that an ES should include:

"a description of the reasonable alternatives studied by the applicant, which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the effects of the development on the environment."

3.1.2 Section 9.3 of the Planning Inspectorate's Advice Note 7 (2020) states that a good ES is one that *"explains the reasonable alternatives considered and the reasons for the chosen option taking into account the effects of the Proposed Development on the environment"*. The ES will include a description of the reasonable alternatives that have been considered, including a clear narrative on the main reasons for selecting the chosen option, including an explanation of how environmental effects have been taken into account. The reasonable alternatives assessment will focus on: the site selection process, design layouts/opportunities within the Site, the sizing and scale of infrastructure, and alternative technologies.

3.1.3 Alternative technologies will only be considered from the perspective of alternative solar technologies. The ES will not consider alternative forms of renewable energy, for example wind, on the basis that the Applicant is a solar developer and therefore did not consider alternative technologies. The recent Sizewell C judgement (2023)[2] reinforced the case that the Applicant does not need to compare different generating technologies such as solar vs. wind vs. nuclear. This is covered in paragraph 131 of High Court Judgement where the judge said promoters need only consider alternatives within the relevant technology type and it would be an absurdity to suggest otherwise.

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

3.1.5 The consideration of alternatives and design evolution will be undertaken with the aim of avoiding and/or reducing significant adverse environmental effects, maintaining operational efficiency and cost-effective design solutions, and with consideration of other relevant matters such as available land and planning policy. This will be aided by the implementation of project design principles which will help guide the design of the Proposed Development.

[2] R. (on the application of Together against Sizewell C Ltd) v Secretary of State for Energy Security and Net Zero [2023] EWHC 1526 (Admin), https://www.judiciary.uk/wp-content/uploads/2023/06/R-Together-Against-Sizewell-C-v-SS-BEIS-judgment-220623-2.pdf

3.2 Approach to assessing alternatives

3.2.1 There is no standard methodology for the site selection of solar farms. The site selection methodology has therefore been informed by relevant planning policy. In particular, the site selection has been informed by adopted and emerging National Policy Statements (NPS) for energy infrastructure, including the following:

- Overarching National Policy Statement for Energy (EN-1) published in 2011 and the Draft NPS EN-1 published in March 2023;
- National Policy Statement for Renewable Energy Infrastructure (EN-3) published in 2011 and the Draft NPS EN-3 published in March 2023;
- National Policy Statement for Electricity Networks Infrastructure (EN-5) published in 2011 and the Draft NPS EN-5 published in March 2023;
- National Planning Policy Framework, published in September 2023; and
- East Riding of Yorkshire local planning policies.

3.2.2 In identifying the Site, the Applicant focused on determining opportunities and constraints within an initial search area surrounding the point of connection. The following fundamental attributes were applied to this search area to determine the most suitable location for the Proposed Development. These attributes are recognised in Draft NPS EN-3 as important criteria affecting the site selection of large scale solar developments:

- Existence of sufficient land, offered by willing landowners, to deliver the project and meet the scale of the Proposed Development's aims;
- Availability and capacity of a suitable Point of Connection to the National Electricity Transmission System (NETS); and
- Solar irradiation levels to support the Proposed Development's potential to produce an efficient and economic energy yield.

3.2.3 The environmental and spatial considerations set out in **Table 3-1** were also part of the site selection process.

Table 3-1 Environmental considerations in site selection

Consideration	Discussion
Agricultural Land Classification and land type	Planning policy seeks to minimise impacts on the best and most versatile (BMV) agricultural land (defined as grades 1, 2 and 3a). Policy directs development on land graded 3b, 4 or 5 and to utilise previously developed land, brownfield land, contaminated land or industrial land where possible. A study of the agricultural land in the area surrounding the Site was carried out, based on publicly available data. Land within the urban boundary of Beverley and Hull was

Consideration	Discussion
	discounted. The land in the western half of the search area (west of Beverley and the river/railway) was identified as grade 2 agricultural land and as such was discounted. The search therefore focussed on the land in the north-east which was identified as predominantly grade 3.
Designated international and national ecological and geological sites	The location of ecological and geological sites within the study area was mapped. The sites are scattered through the study area with clusters in the Hull and Beverley township areas and the river along the southern edge of the study area. These areas were discounted from the area of search.
Nationally designated landscape	The presence of any Areas of Outstanding Natural Beauty (AONBs) or National Parks were considered and excluded from the area of search.
Scheduled monuments	There are a number of Scheduled Monuments within the area of search. When considering alternative sites, their proximity to Scheduled Monuments was taken into account, together with the opportunity to mitigate effects.
Proximity to sensitive human receptors	Consideration was given to the proximity of nearby sensitive human receptors which include residential dwellings, populated areas and villages. The Applicant also considered the location of PRoWs in the area and sought to identify a site which would reduce impact on these routes.
Flooding	Large parts of the search area are located within a flood zone (classified as Flood Zone 2 or Flood Zone 3). The flood zone mapping is based on 'undefended tidal flooding'. As noted above, the search area sought to avoid BMV classified land and instead focussed on the land in the north-east which was identified as grade 3. It is acknowledged this land is also affected by flooding; however, it is not considered this will prohibit a viable solar development on the land. It is considered potential flooding impacts can be appropriately mitigated through detailed design and as such areas, affected by flooding were not discounted, although areas of lower flood risk were considered at an early stage, in compliance with the sequential test for flood risk.

3.2.4 The above considerations for large scale solar development, alongside the key operational criteria, including topography and aspect, and the opportunity

to access the Site during construction and operation, have all been considered and resulted in the Site being identified.

3.3 References

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

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4 APPROACH TO EIA

4.1 Introduction

4.1.1 This chapter sets out the overall approach that will be taken in the EIA for the Proposed Development. The ES will contain the information specified in Schedule 4 of the EIA Regulations. The approach to the assessment has been informed by current best practice guidance.

4.1.2 An overview of the guidance and methodology adopted for each environmental factor assessment is provided within **Chapter 6**.

4.1.3 The environmental factors listed under Regulation 5(2) of the EIA Regulations are presented below.

- Air quality;
- Biodiversity;
- Climate;
- Cultural heritage;
- Population;
- Human health;
- Land and soils (factors combined for the purposes of reporting);
- Landscape and visual;
- Material assets and waste; and
- Water.

4.1.4 It should be noted that although not listed as specific environmental 'factors' under Regulation 5(2) of the EIA Regulations, the following are also considered within this EIA Scoping Report:

- Glint and glare;
- Heat and radiation;
- Major accidents and disasters;
- Noise and vibration;
- Utilities;
- Transport and access; and
- Electric, magnetic and electromagnetic fields.

4.1.5 The proposed structure of the ES is set out in **Appendix E**.

4.2 Consultation

4.2.1 Consultation alongside the EIA process is critical to the development of a comprehensive and proportionate ES. The views of statutory and non-

statutory consultees are important to ensure that the EIA from the outset focuses on specific issues where significant environmental effects are likely, and where further investigation is required.

4.2.2 The consultation, as an ongoing process, enables embedded and additional mitigation measures to be incorporated into the Proposed Development to limit adverse environmental effects and optimise environmental benefits.

4.2.3 Early and ongoing engagement with consultees will be important to influence the design process of the Proposed Development by seeking an appropriate level of feedback from consultees, to ensure that comments are considered in the evolving design. The consultation responses will be recorded in a Consultation Report which will be submitted in support of the DCO application.

4.2.4 Non-statutory consultation was held from 9 October to 6 November 2023 and comprised:

- In-person events at Tickton Village Hall (14 October 2023), Wawne Village Hall (17 October 2023) and Leven Recreational Hall (18 October 2023); and
- Online webinars (19 and 25 October 2023).

4.2.5 The aims of non-statutory consultation are to:

- Outline the broad parameters of the Proposed Development;
- Gather feedback on the early design; and
- Understand key community and stakeholder concerns, insights and proposed design enhancements.

4.2.6 Statutory consultation is expected to be held in Spring 2024. The aims of statutory consultation are to:

- Set out current proposals, demonstrating how the early consultation feedback has been accounted for and considered within the Proposed Development design;
- Take formal feedback to ensure that regard has been had to the views of local community and identify opportunities for further design enhancements; and
- Identify opportunities for further design refinements, if any.

4.2.7 As part of the EIA process, consultation will be undertaken with a range of statutory and non-statutory consultees. It is anticipated at this stage that consultees will include (but are not limited to):

- East Riding of Yorkshire Council;
- Environment Agency;
- Historic England;
- Natural England;

- National Highways;
- Beverley and North Holderness Internal Drainage Board;
- Yorkshire Wildlife Trust;
- Canal & River Trust;
- Royal Society for the Protection of Birds (RSPB); and
- Humberside Fire and Rescue.

4.2.8 The consultation undertaken to date, and the consultation planned, for each of the environmental factor assessments is provided in further detail in **Chapter 6**.

4.3 General difficulties and uncertainties

4.3.1 Factor-specific difficulties and uncertainties are set out in **Chapter 6**. The following key general difficulties and uncertainties apply to a number of environmental factor assessments:

- The detailed design of the Proposed Development is still emerging, as are the environmental surveys and assessments required to support the planning and EIA process. This EIA Scoping Report is provided based on the information available at the time of writing. Where relevant, the proposed scope will be reviewed and updated to reflect developments in the Proposed Development design that may occur post-scoping and agreed with relevant statutory consultees. Any changes to the scope of the EIA will be reported as necessary in the PEIR and/or the ES.
- As the location and area of the components that the Proposed Development comprises are not yet defined or fixed, there is potential for uncertainty regarding the scope of assessment for each factor. However, the description of the Proposed Development presented in **Chapter 2** details the anticipated parameters of the Proposed Development components as they are currently known. Whatever location or footprint is decided and applied, the PEIR and ES will assess the 'worst case scenario' to ensure that the maximum level of significant environmental effects is considered.
- Data from third parties relied upon for the baseline against which any effects will be assessed could potentially be out of date or inaccurate. However, any such data will be procured from reputational and industry standard sources. It will be reviewed and used by competent and experienced professional experts. The combination of appropriate data sources being used by competent and experienced experts should ensure that the data is suitable for its purpose and will therefore provide an appropriate evidence base on which the existing environmental baseline will be informed.

4.4 Defining the study area

4.4.1 Study areas have been defined individually for each environmental factor, taking into account the geographic scope of the potential impacts relevant to that factor and the information required to assess those impacts. The proposed study areas for each environmental factor assessment are described within **Chapter 6**.

4.5 Establishing baseline conditions

4.5.1 Environmental effects of the Proposed Development will be described in the PEIR and ES in relation to the extent of changes to the existing baseline environment as a result of the construction, operation and decommissioning of the Proposed Development.

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

4.5.3 Baseline conditions will be established by:

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

4.5.4 The baseline conditions for each environmental factor assessment will be set out within the respective assessment chapters. Currently known baseline conditions relevant to the individual factor assessments are presented in **Chapter 6**.

4.5.5 As stated above in **Section 4.3**, there is potential that data obtained from third parties is not up to date. The origin of all third-party data used will be clearly identified, alongside any difficulties, uncertainties and assumptions.

4.6 Establishing future baseline conditions

4.6.1 Schedule 4(3) of the EIA Regulations requires consideration of the likely evolution of the current state of the environment (baseline scenario) in the absence of the Proposed Development, as far as natural changes from the baseline scenario can be assessed with reasonable effort on the basis of the availability of environmental information and scientific knowledge (the 'future baseline'). Whilst there are considerable limitations to the predictions that can be made about natural baseline conditions at a future point in time, reasonable effort will be made to characterise the future baseline in the absence of the Proposed Development in each environmental factor assessment. In addition, some assessments require projections to account for future change, such as traffic growth within the assessment of likely significant environmental effects associated with the Proposed Development.

4.7 Assessment scenarios

4.7.1 The assessment scenarios that are being considered for the purposes of the EIA are as follows:

- Existing baseline (without Proposed Development) – Reported at the time that the baseline data has been collected.
- Future baseline (without the Proposed Development) – For comparison with the construction phase, operational phase and decommissioning phase.
- Construction of the Proposed Development – As presented in **Chapter 2**, construction is scheduled to commence in 2026 and last for approximately 24 months. The environmental factor assessment chapters will assess the relevant 'worst case' construction scenario and where necessary, the relevant period or 'peak' of activity within the construction programme.
- Operation of the Proposed Development – The environmental factor assessment chapters will assess the relevant 'worst case' scenario where necessary. Consideration will need to be given to the phased approach to construction of the Proposed Development.
- Decommissioning of the Proposed Development.

4.8 Approach to mitigation

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

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

4.8.2 The Institute of Environmental Management and Assessment's (IEMA) 'Environmental Impact Assessment Guide to Shaping Quality Development' (2015) refers to three distinct forms of mitigation:

- **Primary** – an intrinsic part of the project design
- **Secondary** – typically described within the factor chapters of the Environmental Statement, but often are secured through planning conditions and/or management plans.
- **Tertiary** – required regardless of any EIA, as it is imposed, for example, as a result of legislative requirements and/or standard sectoral practices.

4.8.3 For the purposes of this EIA Scoping Report, the PEIR and the ES, embedded 'primary' mitigation measures will form part of the Proposed Development for which consent is sought. **Table 4.1** describes the currently known embedded (primary) environmental mitigation measures that are considered to be an inherent part of the Proposed Development i.e., the project design principles adopted to avoid or prevent adverse environmental effects, based on the design of the Proposed Development to date. It should be noted that these will likely evolve over the course of the design evolution, up to submission of the DCO application.

4.8.4 These embedded (primary) environmental mitigation measures should not be confused with additional (secondary and tertiary) mitigation measures proposed in order to avoid, prevent or reduce and, if possible, offset likely significant adverse effects on the environment, which are described under the 'Additional (Secondary and Tertiary) Mitigation Measures' section within each environmental factor assessment section (**Chapter 6**).

Table 4-1 Embedded (primary) environmental mitigation measures

Environmental Factor to which the Embedded (Primary) Environmental Mitigation Measure Relates	Embedded (Primary) Environmental Mitigation Measure
Biodiversity	Proposed Development design will incorporate a minimum offset distance of 10 m from any trees and 5 m from any hedgerows.
Biodiversity	Proposed Development will avoid any development on areas of important or priority habitat.
Biodiversity Water	Proposed Development design will incorporate a minimum offset distance of 10 m from all watercourses and ditches.
Biodiversity Landscape	Proposed Development design will incorporate a minimum offset distance of 10 m from all PRoW.
Biodiversity Landscape	Where possible, existing hedgerows, woodland, ditches and field margins will be retained. Any breaks or crossings (associated new tracks, security fencing and/or cable routes) will be designed to use existing agricultural tracks between fields and the width of any breaches will be kept to a minimum.
Cultural heritage	No solar modules or infrastructure will be erected in Fields E6 and E7, which border Meaux duck decoy Scheduled Monument. This

Environmental Factor to which the Embedded (Primary) Environmental Mitigation Measure Relates	Embedded (Primary) Environmental Mitigation Measure
	will decrease the likelihood and severity of physical and setting impacts on this asset during the construction and operation phases.
Cultural heritage	There will be a buffer zone of 50 m to the south of Meaux Abbey Scheduled Monument, where no solar modules or infrastructure will be erected. This will decrease the likelihood and severity of physical and setting impacts on this asset during the construction and operation phases.
Cultural heritage	No solar modules or infrastructure will be erected in Field A2 (in Land Area A), where non-designated heritage asset HER MHU13240 (the site of a building) is located. This will avoid physical impacts on this asset during the construction phase.
Noise and vibration	The two on-site substations will not be within 250 m of residential properties or any environmental designation.
Water (flood risk)	Electrical infrastructure (substations, inverters, BESS and switchgear) to be sited in locations at low risk of flooding and/or set at the necessary minimum ground levels determined by the Flood Risk Assessment and in agreement with the relevant prescribed consultees.
Water	For dispersed hardstanding such as containerised infrastructure, runoff is to be directed to ground locally via their gravel beds.
Water	Where hardstanding is concentrated, e.g., substation concrete bases, larger buildings or concentration of containers, a formal drainage strategy will be included, most likely discharging at greenfield rates to the nearby watercourse network.
Utilities	Offsets will be implemented as required by the relevant statutory undertaker.

4.9 Assessment of likely significant environmental effects

4.9.1 The PEIR and ES will report on the likely significant environmental effects for the site preparation, earthworks and construction (hereafter referred to as 'construction'), operational (i.e., once completed and open to use, and including maintenance) and decommissioning phases of the Proposed Development.

4.9.2 The following criteria will be taken into account when determining significance:

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

4.9.3 The method for assessing significance of effects varies between environmental factors but, in principle, will be based on the environmental sensitivity (or value/importance) of a receptor/resource and the magnitude of change from the baseline conditions. The approach to assessing the significance of effects for each individual environmental factor assessment is outlined within **Chapter 6** and **Appendix D**.

4.9.4 Summary of effect tables that summarise the likely significant environmental effects associated with each of the environmental factors will be provided in the ES at the end of each environmental factor assessment chapter. These tables will outline sensitive receptors, additional mitigation measures and residual effects. A distinction will be made between direct, indirect, secondary, short-term, medium-term and long-term, permanent and temporary, positive and negative effects. Cumulative effects will be considered as a single coordinated assessment.

4.10 Opportunities for enhancing the environment

4.10.1 Where possible, the Applicant will seek to identify opportunities for enhancement within the relevant environmental factor assessments. Enhancement is defined as "*a measure that is over and above what is required to mitigate the adverse effects of a project"* (National Planning Policy

Framework, 2023). Therefore, any identified enhancement measures will not be taken into account when determining the significance of effects.

4.10.2 Enhancement measures will be assessed in accordance with steps set out in the National Planning Policy Framework (2023).

4.11 References

Environmental Impact Assessment Guide to Shaping Quality Development (2015). Institute of Environmental Management and Assessment (IEMA). Available online: https://www.iaia.org/pdf/wab/IEMA%20Guidance%20Documents%20EIA%20Guide%20to%20Shaping%20Quality%20Development%20V6.pdf

National Planning Policy Framework (2023). Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf

5 ENVIRONMENTAL FACTORS PROPOSED TO BE SCOPED OUT OF FURTHER ASSESSMENT

5.1.1 As part of the EIA process and based on the information available to date, there are a number of environmental factors, as listed under **Section 4.1** above, for which it is considered an assessment as part of the EIA is not justified, and therefore are proposed to be scoped out of further assessment.

5.2 Water

5.2.1 This section considers the potential effects associated with the Proposed Development on flood risk and surface water drainage and provides justification for the proposal to exclude water from the scope of the EIA.

5.2.2 This section reflects analysis carried out to date and consultation carried out with the Environment Agency, East Riding of Yorkshire Lead Local Flood Authority and the Beverley and North Holderness Internal Drainage Board. The potential effects on groundwater are considered in **Section 6.5: Land, soils and groundwater**.

5.2.3 The Site occupies predominantly low-lying land which relies on a complex network of drainage systems including ditches, culverts and pumping stations. The low-lying system is managed by the Beverley and North Holderness Internal Drainage Board; only a small part of land required for cabling routes falls outside the Internal Drainage Board area. Five Environment Agency-designated Main Rivers flow through the Site:

- The River Hull;
- Holderness Drain;
- Monk Dike;
- Meaux and Routh East Drain; and
- The Beverley and Barmston Drain.

Flood risk

5.2.4 Large parts of the Site are shown to fall within Flood Zones 2 and 3, which represent the risk of flooding, ignoring the presence of existing defences. Parts of the Site are also shown to be at risk from surface water flooding, although this is largely reflective of the risk of fluvial flooding, and mitigation to manage fluvial flooding will be sufficient to manage the risk from other sources of flooding.

5.2.5 The Site benefits from substantial defences, including the River Hull Tidal Surge Barrier and extensive raised defences along the Humber Estuary and

the tidally influenced River Hull and Monk Dike which discharges to it. During early engagement, the Environment Agency confirmed that it did not consider the Site to be at significant risk of tidal flooding due to the presence of the tidal barrier and associated defences.

5.2.6 The Environment Agency has provided model outputs for the Site which predict fluvial flooding in some areas from overtopping of the inland defences during a design flood event. It was agreed with the Environment Agency that placing solar modules in areas shown to be at risk would be acceptable subject to panel edges and vulnerable infrastructure being raised above the design flood level, ideally with 0.3 m of additional freeboard allowance to account for uncertainty. This is consistent with the approach taken on other solar farms locally and nationally.

5.2.7 The Environment Agency requested that the residual risk of flooding be considered by simulating catastrophic failure of discrete reaches of earth embankments. The simulation results would inform mitigation to be embedded within the design of the Proposed Development, notably by locating solar modules and sensitive infrastructure above the resulting maximum flood level. A copy of the model is awaited from the Environment Agency to allow breach modelling to be undertaken.

5.2.8 Although there is some uncertainty with regard to the risk of flooding, particularly during a residual risk event, the approach to mitigation has been agreed with the Environment Agency. By raising the solar modules and vulnerable infrastructure above the derived flood levels, the risk to the Proposed Development is effectively avoided. The only change in the floodplain will therefore be the presence of the array supports, the vast majority of which will be thin piled steel foundations, and potentially some raised plinths for associated infrastructure. These will have an insignificant impact on floodplain storage and therefore would not have a significant effect on off-site flood risk.

5.2.9 Embedded mitigation will also manage the risk of increased runoff from hardstanding or containerised infrastructure. The Proposed Development will result in improved percolation of rainwater and reduction in runoff and soil erosion (explained below) and consequently have minor benefit in terms of surface water flood risk. In addition, the proposed drainage strategy will manage the risk of increased runoff from hardstanding or containerised infrastructure.

5.2.10 Dispersed hardstanding or containerised infrastructure will direct rainfall to the ground locally, as per the existing situation. If a concentration of containers or hardstanding is proposed, a more formal drainage strategy will be embedded within the designs. This will limit runoff rate to equivalent greenfield runoff rates (presuming infiltration will not be viable) through a sustainable drainage approach. It will manage runoff generated during a design (1 in 100 year plus climate change) storm and consequently meet the requirements of the National Planning Policy Framework.

5.2.11 The Site access tracks will be formed from permeable materials and consequently allow rainwater to percolate into the underlying ground, as per the existing situation.

5.2.12 The risk of increased runoff during construction will be managed through the implementation of the Outline Construction Environmental Management Plan. This will include measures such as use of permeable materials for construction or lay-down areas; constructing and using access tracks early in the programme; use of low-pressure tyres to limit compaction; and use of tillage, or similar, to break up compacted soils.

5.2.13 It is therefore concluded that the risk of flooding to the Proposed Development can be adequately mitigated, which will be confirmed and explained through the standalone Flood Risk Assessment to be submitted in support of the DCO application. The Flood Risk Assessment will explain the benefits to surface water flood risk arising from the Proposed Development. It will also present the proposed strategy drainage to manage runoff from proposed impermeable areas. As a result, the Proposed Development would have an overall minor benefit to flood risk and consequently meet the aims of the National Planning Policy Framework.

Water quality

5.2.14 The Site is located within the Humber River Basin District, Hull and East Riding Management Catchment and Hull Lower Operational Catchment. The Site also sits within five water body areas; Beverley and Barmston Drain, Hull from Arram Beck to Humber, Holderness Drain Source to Foredyke, Foredyke Stream Lower to Holderness and a small part in Foredyke Stream Upper.

5.2.15 The Water Framework Directive (WFD) status for all the above water bodies is ‘Moderate ecological status’, meaning they would have a low sensitivity in relation to water quality.

5.2.16 According to Environment Agency (2023) data, the reason for not achieving good status is predominantly due to agriculture and rural land management practices.

5.2.17 Large parts of the Site are in arable use, growing single crops in large stands. It is understood that the current practice is to leave fields bare following harvest. The lack of year-round vegetation and associated reduction in soil biological activity negatively effects soil structure and reduces its ability to infiltrate water resulting in increased runoff rates. The lack of soil armouring also increases the formation of surface crusts, which increases runoff rates and/or causes erosion of the soil surface carrying pollutants into the local drainage network.

5.2.18 Across the Site, the cessation of agricultural activities would have beneficial effects in terms of runoff rates and water quality. Where grazing or pasture

practices currently exist, stocking densities would be reduced, as would the use of machinery, leading to less compaction. The reduction in the application of herbicides and fertilisers would also result in a reduction of pollution of groundwater and surface water resources.

5.2.19 The Proposed Development would allow the establishment of a healthy soil ecosystem, an increase in organic matter content, and associated improvements in soil structure, especially in areas which were formally ploughed and left to bare earth following harvest and those areas where overgrazing and trafficking has caused compaction and erosion. The solar modules would also protect the ground from intense rainfall whilst vegetation is becoming established and should reduce the formation of surface crusts.

5.2.20 The proposed drainage strategy would provide sufficient cleansing of runoff from hardstanding areas or containers (which would have a very low pollution load). This will be assessed and confirmed by the Flood Risk Assessment.

5.2.21 The Outline Construction Environmental Management Plan would confirm measures required to manage the risk of soil erosion, sediment and pollution entering the watercourses. Measures would include storing chemicals (if required) in oversized containers away from watercourses, temporary measures such as sediment traps, temporary bunding or similar to minimise migration of spillages.

5.2.22 The activities required during decommissioning of the Proposed Development would be similar to those of the construction phase. An Outline Decommissioning Environmental Management Plan will be submitted in support of the DCO application. This plan will identify mitigation to minimise potential impacts arising from the decommissioning of the Proposed Development, notably measures to reduce or rectify soil compaction referred to above.

5.2.23 The nature of the Proposed Development, including the agreed approach to mitigate flood risk to and from the Site, means it would have an overall beneficial impact on runoff and flood risk. The mitigation will be confirmed and explained through the standalone Flood Risk Assessment and the Outline Construction Environmental Management Plan, both of which will be submitted in support of the DCO application.

5.3 Electric, magnetic and electromagnetic fields

5.3.1 Electric fields are produced by voltage, which is the pressure behind the flow of electricity and which depends on the operating voltage of the equipment. Magnetic fields are produced by current, which is a measure of the flow of electricity and depends on the electrical current.

5.3.2 Electrical fields can be blocked by fences, shrubs and buildings and the intensity of the electric and magnetic fields decreases from the source.

5.3.3 As referenced in Draft NPS EN-5, the 1998 guidelines published by International Commission on Non-Ionizing Radiation Protection (ICNIRP, 1998), states that underground cables and overhead power lines at voltages up to and including 132 kV are not capable of exceeding the ICNIRP exposure guidelines. The operation of the Proposed Development will use up to 132 kV underground cables.

5.3.4 The Proposed Development is being guided by several design principles, which include a minimum 250 m offset from the two on-site substations to residential properties and a minimum of 10 m offset from PRoW to avoid the potential for any electromagnetic field effects on sensitive receptors.

5.3.5 It is therefore proposed to exclude electric, magnetic and electromagnetic fields from the scope of the EIA.

5.4 Glint and glare

5.4.1 Solar PV modules are specifically designed to absorb light rather than reflect it. Light reflecting from solar PV modules results in the loss of energy output. Solar PV modules are dark in colour due to their anti-reflective coatings and are manufactured with low-iron, ultra-clear glass with specialised coatings and textures to enable maximum absorption. The combination of these factors significantly increases electrical energy production of the panels and significantly reduces reflected rays at the same time.

5.4.2 It is understood from available studies that reflections produced from solar panels are of intensity similar to or less than those produced from still water and significantly less than reflections from glass and steel.

5.4.3 There are no guidelines setting out a particular methodological approach to delivering a glint and glare assessment. The Draft National Policy Statement EN-3 states in Sections 3.10.149 and 3.10.150:

“Solar PV panels are designed to absorb, not reflect, irradiation. However, the Secretary of State should assess the potential impact of glint and glare on nearby homes, motorists, public rights of way, and aviation infrastructure (including aircraft departure and arrival flight paths)”.

“Whilst there is some evidence that glint and glare from solar farms can be experienced by pilots and air traffic controllers in certain conditions, there is no evidence that glint and glare from solar farms results in significant impairment on aircraft safety. Therefore, unless a significant impairment can be demonstrated, the Secretary of State is unlikely to give any more than limited weight to claims of aviation interference because of glint and glare from solar farms”.

5.4.4 A detailed stand-alone glint and glare assessment will be undertaken and appended to the ES submitted in support of the DCO application, considering ground-based (roads, residential dwellings, and PRoW) and aviation (Air

Traffic Control Towers, aircraft approach paths, and final sections of visual circuits) receptors. Detailed geometric analysis will be undertaken using a bespoke glint and glare model for all receptors potentially affected by the Proposed Development. The outputs of the assessment will inform the design development and landscape mitigation plan.

5.4.5 There is no formal guidance with regard to the maximum distance at which glint and glare should be assessed. From a technical perspective, there is no maximum distance for potential reflections. The significance of a reflection, however, decreases with distance because the proportion of an observer's field of vision that is taken up by the reflecting area diminishes as the separation distance increases. Terrain and shielding by vegetation are also more likely to obstruct an observer's view at longer distances. The above parameters and extensive experience over a significant number of glint and glare assessments undertaken show that consideration of receptors within 1 km of panel areas is appropriate for glint and glare effects on roads and dwellings.

5.4.6 Therefore, residential receptors and major national/regional roads identified within 1 km of the Site boundary will be considered as sensitive receptors.

5.4.7 PRoWs will be considered at a high-level without technical modelling, due to the sensitivity of the receptors (in terms of amenity and safety) being concluded to be of low significance.

5.4.8 There is no formal distance within which aviation effects must be modelled. However, in practice, concerns are most often raised for developments within 10 km of a licensed airport. Requests for modelling at ranges of 10-20 km are far less common. Assessment of aviation effects for developments over 20 km away is a very unusual requirement. Therefore, any airfields or airports within 10 km of the solar panel boundary will be considered.

5.4.9 Aviation receptors at Beverley/Linley Hill Airfield and Hill Farm Airstrip will be taken forward for technical modelling. The assessment will consider any Air Traffic Control Towers (if identified), the path of approach for landing, as well as final sections of visual circuits. The approach phase (arrival flight paths) will be considered in the estimation of impact as this is deemed to be the most sensitive phase of a flight. Departing aircraft will have the nose pointing upwards and the visibility of objects (i.e., reflective panels) located on the ground will be significantly reduced due to vertical field of view restrictions and cockpit obstruction. Therefore, departure paths will not be modelled.

5.4.10 Aviation activity at Burton-Constable Airstrip will be considered at a high-level without technical modelling, due to the distance from the Proposed Development.

5.4.11 Any predicted impacts towards the ground-based infrastructure (roads and dwellings) can likely be solved with relatively simple mitigation strategies – the

most common being the provision of screening (e.g. hedgerow planting) at the Site perimeter to obstruct views of potentially reflecting panels. Where views of reflecting panels are obstructed, no effects can be experienced. Other solutions such as layout modification can be considered, but are rarely required in practice.

5.4.12 Whilst formal guidance within the UK for quantifying impacts is sparse, the industry standard is to evaluate effects on aviation receptors based on their intensity (specifically the potential for a temporary after-image) as well as their duration and operational sensitivity. Any “significant” impacts identified through the process of modelling within the impact assessment will be adequately mitigated such that any impacts cannot be considered “significant”. In practice, this means quantifying whether potential effects are possible for approaching pilots and/or air traffic controllers and, if so, demonstrating that any effects are of acceptably low intensity. Where appropriate, evaluation of effects, duration, and the origin of the glare is considered. Technical mitigation options for aviation receptors can involve modifications to the panel configuration including varying the vertical tilt, azimuth angle and panel footprint.

5.4.13 Based on all of the above, it is proposed that glint and glare be scoped out of the ES. However, a description of any relevant proposed mitigation measures and safety considerations of the Proposed Development will be included within the Proposed Development description chapter of the ES.

5.5 Heat and radiation

5.5.1 Due to the scale and nature of the Proposed Development, it is not anticipated that there will be any significant sources of heat or radiation during construction, operation or decommissioning. It is therefore proposed to exclude heat and radiation from the scope of the EIA.

5.6 Human health

5.6.1 It is proposed that consideration of the potential effects to human health as a result of the Proposed Development will be covered through the findings of other assessments undertaken as part of the EIA process, as follows:

- Air quality;
- Landscape and visual;
- Noise and vibration;
- Transport and access; and
- Population.

5.6.2 Each of these chapters within the EIA Scoping Report and subsequent PEIR and ES will consider the potential effects to human health within their own assessments. Outside of the EIA process, a glint and glare assessment will

be undertaken (see **Section 5.4** above), which will consider the potential human health effects from glint and glare.

5.6.3 As any potential human health impacts will be captured by the aforementioned assessments and there are not expected to be any significant human health impacts outside of these assessments, it is proposed that human health is not subject to dedicated assessment and therefore excluded from the scope of the EIA.

5.7 Major accidents and disasters

5.7.1 Guidance on the consideration of major accidents and disasters is provided by 'Major Accidents and Disasters in EIA: An IEMA Primer' (IEMA, 2020a). This focuses on the consideration of low likelihood/high consequence events which would result in serious harm or damage to environmental receptors, and which could encompass risks exacerbated by climate change. This includes accidents or disasters originating from a proposed development as well as external events (man-made or natural).

5.7.2 In considering the potential for significant effects from the vulnerability of the Proposed Development to risks of accidents and disasters, it is important to note that the UK already has a structured framework of risk management legislation in place. Vulnerability to major accidents and/or disasters for infrastructure and other built environment developments is covered by a wide range of other safety and non-safety-related legislation, as detailed below:

- Health and Safety at Work Act 1974;
- Construction (Design and Management) Regulations 2015;
- The Construction (Health, Safety and Welfare) Regulations 1996; and
- Electricity Safety, Quality and Continuity Regulations 2002.

5.7.3 The risk of major accidents and disasters will be considered throughout the design process of the Proposed Development. This will include siting the potentially hazardous equipment, such as the BESS and grid infrastructure, at a suitable distance from sensitive receptors.

5.7.4 The construction, operation and decommissioning phases of the Proposed Development have the potential for limited interactions which may give rise to major accidents and/or disaster. **Table 5-1** presents a list of possible major accidents and disasters that will require consideration.

Table 5-1 Possible major accidents and disasters

Major accident and/or disaster	Potential receptor	Comments
Flooding	Properties	Large parts of the Site are located within Flood Zone 2 (between a 1 in 1000 and 1 in 100 annual exceedance probability of

Major accident and/or disaster	Potential receptor	Comments
	Local residents	flooding) and Flood Zone 3 (a 1 in 100 or greater annual exceedance probability of flooding), predominantly on the basis of undefended tidal flooding. However, the Site is defended by the Hull Tidal Surge barrier and extensive tidal embankments, meaning it is not considered to be at significant risk of tidal flooding. The Site is not considered to be at significant risk of river flooding or surface water flooding if potentially vulnerable infrastructure is sufficiently raised. The vulnerability of the Proposed Development to flooding and its potential to exacerbate flooding, will be covered in the standalone Flood Risk Assessment to be submitted in support of the DCO application.
Fire	Properties Local residents Local habitats and species	There is a potential fire risk associated with the BESS. This will be managed by a cooling system, which will form part of the BESS and which is designed to regulate temperatures to safe conditions to minimise the risk of fire. The BESS and associated grid infrastructure will be sited a suitable distance from sensitive receptors in accordance with BESS standards (UL9540). Humberside Fire and Rescue Service will be consulted as part of the DCO process. An Outline Battery Safety Management Plan will be produced and submitted in support of the DCO application to account for the potential safety risks and the relevant mitigation and management procedures.
Aircraft disasters	Pilots	The potential for glint and glare to affect aircraft will be considered within the glint and glare assessment, which will form a technical appendix to the ES (refer to **Section 5.4** above).

Major accident and/or disaster	Potential receptor	Comments
Plant disease	Habitats and species	New planting may be susceptible to biosecurity issues, such as increased prevalence of pests and disease, due to source of provenance and climate change. The planting design and Outline Landscape and Ecological Management Plan will take account of and manage biosecurity risks.

5.7.5 Those major accidents and disasters that are not considered within the scope of the existing technical assessment will continue to be reviewed and addressed as part of the design process. The construction, operation and decommissioning of the Proposed Development are not considered to have a risk of major accidents or disasters that could affect existing or future receptors, which are not considered through existing design mitigation and regulatory regimes.

5.7.6 The mitigation in place is generally sufficient to manage vulnerabilities to major accidents and/or disasters without the need for additional mitigation in most circumstances. It is not expected that inclusion of major accidents and disasters in the EIA scope would add any greater level of safety performance to that already established process. By implementing recognised and approved safety legislation and regulation, no significant effects in relation to major accidents and disasters are anticipated during the construction, operation and decommissioning phases.

5.7.7 It is therefore proposed to exclude major accidents and disasters from the scope of the EIA.

5.8 Material assets (and waste)

5.8.1 Material assets can be defined as "*substances used in each lifecycle stage of a development, with particular focus on the construction, operation and maintenance, and decommissioning or 'end of first life' (deconstruction, demounting, demolition and disposal) phases*" (IEMA, 2020b). Material assets can include 'material' (i.e. physical resources that are used across the lifecycle of a development) and 'excavated arisings' (i.e. soil, rock, or similar resource generated by excavations).

5.8.2 Waste is defined as "*any substance or object which the holder discards or intends or is required to discard*" (IEMA, 2020b). The Waste Framework Directive (European Parliament and the Council, 2008) definition includes any substance or object that is discarded for disposal or that has not been subject to acceptable recovery (including reuse and recycling).

5.8.3 The main impacts (changes) and effects (consequences) of materials consumption and waste disposal are presented in **Table 5-2**.

Table 5-2 Material assets (from IEMA guide to Materials and Waste in Environmental Impact Assessment)

Matter	Direct impacts	Adverse effect	Applicable development phase
Materials	Consumption of resources	Depletion of resources, resulting in the temporary or permanent degradation of the natural environment.	Construction, decommissioning
Waste	Generation and disposal of waste	Reduction in landfill capacity. Unsustainable use or loss of resources to landfill resulting in the temporary or permanent degradation of the natural environment.	Construction, decommissioning

5.8.4 The indirect impacts associated with materials consumption and waste disposal (e.g. release of greenhouse gas emissions, water consumption, amenity impacts, ecological impacts, etc) will be assessed elsewhere within the EIA. Similarly, the indirect impacts of any off-site waste management facilities and material production facilities are expected to be assessed (and where necessary, mitigated) under the planning and permitting regime for those sites and thus do not form part of an EIA for a development that uses such facilities for material supply or waste management.

5.8.5 A description of the potential streams and volumes of construction materials and waste disposal will be described within the 'Description of the Proposed Development' chapter of the ES. In addition to this, the Outline Construction Environmental Management Plan will set out how construction materials and waste will be managed on-site, and opportunities to recycle waste will be explored. Where possible, development-specific commitments for sustainable resource management will be presented within the ES. As part of the detailed Construction Environmental Management Plan, prepared by the Contractor following the making of the DCO, there would be a requirement to develop and implement a Site Waste Management Plan and Materials Management Plan in advance of the construction works. An Outline Decommissioning Environmental Management Plan will be submitted in support of the DCO application, which will set out how the waste will be managed and detail opportunities for re-use and recycling.

5.8.6 It is also not intended to remove significant quantities of excavated arisings from the Site during construction (there are currently no demolition works

proposed, for example). There may, however, be a need to remove some soils from the Site for treatment or disposal, if found to be contaminated, and it is not practical to treat this on-site. However, where possible, soil arisings will be balanced through a cut and fill exercise to retain volumes on-site.

5.8.7 For the operational phase, the potential streams and volumes of construction materials and waste disposal will be described within the 'Description of the Proposed Development' chapter of the ES. There will be relatively little waste produced during the operation phase and the requirement for material assets will be limited to maintenance and replacement parts, as required.

5.8.8 During decommissioning, the removal of any material assets and waste will be recycled or disposed of in accordance with good practice and market conditions at that time. If items can be recycled, this will be the first-choice option.

5.8.9 Taking the above into account, it is not proposed to prepare a separate material assets and waste chapter as part of either the PEIR or ES.

5.9 Utilities

5.9.1 The Proposed Development has the potential to affect existing utility infrastructure located at the Site. Given the nature of the Proposed Development, potential impacts on existing utility assets would be limited to the construction phase. To identify any existing infrastructure constraints, a utility search covering the Site has been undertaken.

5.9.2 A utility search identified several assets within the Site boundary that will require careful consideration as the design of the Proposed Development evolves, including:

- High pressure gas mains;
- Water pipes;
- Telecoms cables;
- Electrical cables; and
- Drainage.

5.9.3 Further consultation will be carried out with the relevant utility companies (including Yorkshire Water, Northern Powergrid, Northern Gas Networks, BT Openreach and KCOM) to confirm the information drawn from the utility search is accurate and up to date. In addition, consideration and advice will be sought regarding separation distances and methods of construction in close proximity to each utility to avoid any risk of impact during construction of the Proposed Development. This information will be used to inform the layout of the Proposed Development and reported within the ES as embedded (primary) mitigation.

5.9.4 The Outline Construction Environmental Management Plan will include any additional mitigation measures to protect against interference with below ground utilities during construction. The Applicant would also expect to agree protective provisions with each utility owner, in order to ensure the DCO includes appropriate protections and restrictions on the Applicant's exercise of its powers, for the protection of utilities.

5.9.5 Taking the above into account, it is not proposed to prepare a separate utilities chapter as part of either the PEIR or ES.

5.10 Transboundary effects

5.10.1 Regulation 32 of the EIA Regulations requires the consideration of any likely significant effects on the environment of another European Economic Association (EEA) State. The consideration of transboundary effects is also detailed within the Planning Inspectorate's Advice Note Seven (2020).

5.10.2 Due to the nature and location of Proposed Development, it is not anticipated that the Proposed Development will lead to potential for any likely significant effects on the environment of another European Economic Association (EEA) State. Therefore, a transboundary screening matrix has not been included within this EIA Scoping Report.

5.11 References

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

Draft National Policy Statement for Renewable Energy Infrastructure (EN-3) 2023. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147382/NPS_EN-3.pdf

Draft National Policy Statement for Electrical Networks Infrastructure (EN-5) 2023. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147384/NPS_EN-5.pdf

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European Parliament and the Council (2008), 'Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and

repealing certain Directives (Text with EEA relevance)'. Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32008L0098

HMSO (1974), 'Health and Safety at Work Act 1974'. Available online: https://www.legislation.gov.uk/ukpga/1974/37/contents

HMSO (2015), 'The Construction (Design and Management) Regulations 2015'. Available online: https://www.legislation.gov.uk/uksi/2015/51/contents/made

HMSO (1992), 'The Workplace (Health, Safety and Welfare) Regulations 1992'. Available online: https://www.legislation.gov.uk/uksi/1992/3004/contents/made

HMSO (2022), 'The Electricity Safety, Quality and Continuity Regulations 2002'. Available online: https://www.legislation.gov.uk/uksi/2002/2665/contents/made

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IEMA (2020a), 'Major Accidents and Disasters in EIA: A Primer'. Available online: https://www.iema.net/resources/blog/2020/09/23/iema-major-accidents-and-disasters-in-eia-primer

IEMA (2020b), 'IEMA guide to Materials and Waste in Environmental Impact Assessment'. Available online: https://www.iema.net/resources/reading-room/2020/03/30/materials-and-waste-in-environmental-impact-assessment

6 ENVIRONMENTAL FACTORS PROPOSED TO BE SCOPED INTO FURTHER ASSESSMENT

6.1 Air quality

6.1.1 Consultation

No consultation to inform the air quality assessment has been undertaken to date. Consultation with East Riding of Yorkshire Council will be carried out to agree:

- The appropriate data for baseline characterisation;
- Receptor locations to be assessed in the study (such as human receptors and ecologically sensitives sites); and
- The assessment methodology.

6.1.2 Study area

Construction and decommissioning

Based on the Institute of Air Quality Management (IAQM) construction dust guidance v2.1 (IAQM, 2023), the study area for sensitive human receptors for earthworks and general construction activities will be up to 250 m from the Site boundary. The study area for sensitive ecological receptors for earthworks and general construction activities will be up to 50 m from the Site boundary. For trackout activities, the study area for both sensitive human and ecological receptors will be up to 50 m from the edge of the roads likely to be affected by trackout[3].

6.1.3 Data sources to inform the EIA baseline characterisation

A desk-based baseline air quality review will be carried out to establish existing air quality conditions within the study area. Information on air quality will be gathered from the monitoring stations that form a part of the national and/or local networks and from the estimated background air quality maps published by the Department for Environment, Food and Rural Affairs (Defra).

6.1.4 Surveys to inform the EIA baseline characterisation

Air quality is considered to be good in the local area (see **Section 0**) and therefore it is anticipated that on-site air quality monitoring will not be required to inform the assessment.

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

6.1.5 Baseline conditions

The Proposed Development is located within the administrative area of East Riding of Yorkshire Council. There are currently no Air Quality Management Areas (AQMAs) declared within the district. Overall, air quality is considered to be good in the local area.

According to the East Riding of Yorkshire Council 2023 Air Quality Annual Status Report, East Riding of Yorkshire Council undertook automatic monitoring at seven sites and non-automatic nitrogen dioxide (NO_2) diffusion tube monitoring at 92 locations during 2022.

The nearest monitoring location is an NO_2 diffusion tube location (East Riding of Yorkshire Council ref: S92) situated approximately 1.8 km north-west from the Proposed Development. S92 NO_2 diffusion tube location was new for 2022. The measured annual average NO_2 concentration at this diffusion tube site was 20.8 µg/m^3 in 2022, which was well below the annual mean NO_2 air quality objective of 40µg/m^3.

Estimated background air quality data are available from the UK-AIR website operated by Defra. The website provides estimated annual average background concentrations of NO_2, PM_{10} and $PM_{2.5}$ on a 1 km^2 grid basis from local air quality management (LAQM) background maps. It is noted that estimated 2022 annual average background NO_2, PM_{10} and $PM_{2.5}$ concentrations at the Site were 6.1µg/m^3, 14.6 µg/m^3 and 7.7 µg/m^3 respectively, which were below the relevant air quality objectives (NO_2 air quality objective: 40 µg/m^3; PM_{10} air quality objective: 40 µg/m^3; $PM_{2.5}$ air quality objective: 20 µg/m^3).

Human receptors have been identified within 250 m of the Site. Ecological receptors within 50 m of the Site comprise:

- Cote Wood ancient semi-natural woodland (borders the Site boundary);
- Cote Wood Local Wildlife Site (borders the Site boundary); and
- Meaux Local Wildlife Site (35 m from the Site boundary).

6.1.6 Additional (secondary and tertiary) mitigation

Construction and decommissioning

Construction phase site-specific dust mitigation measures will be based on the results of the pre-mitigation dust impacts assessment, which will also be applied to the decommissioning phase, where relevant.

6.1.7 Description of likely significant effects

Construction and decommissioning

Construction and decommissioning works have the potential to release dust, including fine particulate matter, which can impact nearby sensitive human and ecological receptors. Appropriate dust control measures can be highly effective for controlling emissions from potentially dust generating activities, and adverse effects can be greatly reduced or eliminated. With suitable dust mitigation measures in place, the effect of dust and particulate matter emissions during construction is likely to be ‘not significant’.

Construction and decommissioning traffic will comprise haulage/construction vehicles and vehicles used for workers' trips to and from the Site. The greatest potential impact on air quality due to emissions from construction phase vehicles will be in areas adjacent to the Site access and nearby road network. Based on the temporary nature of the construction and decommissioning activities, it is considered unlikely that significant numbers of vehicle movements associated with staff commuting to and from the Site will be generated to result in a significant effect on local air quality.

6.1.8 Receptors/matters to be scoped into further assessment

Receptor/Matter	Phase	Justification
Dust and particulate matter emissions resulting from Site activities (demolition (during decommissioning phase only), earthworks, construction and trackout), including the operation of the equipment	Construction and decommissioning	Sensitive receptors are located within 250 m of the Site. A qualitative, desk-based assessment of site activities is proposed to identify the type of mitigation required. The operation of site equipment and machinery during construction will also result in emissions to the atmosphere of exhaust gases. A qualitative, desk-based assessment is proposed to identify the type of mitigation required.
Traffic exhaust emission (including emissions from haulage/construction vehicles and vehicles used for workers' trips to and from the Site)	Construction and decommissioning	A screening level qualitative assessment is proposed. Road traffic data is required to undertake the qualitative assessment, which is not yet available. However, based on the temporary nature of the construction and decommissioning activities, it is anticipated that vehicle movements associated with staff commuting to and from the Site during the construction and decommissioning phase will not have a significant effect on local air quality. However, this will be confirmed by the qualitative assessment.

6.1.9 Receptors/matters to be scoped out of further assessment

Receptor/Matter	Phase	Justification
Dust and particulate matter emissions resulting from demolition works	Construction	There are no demolition works proposed during the construction phase.

Dust and particulate matter emissions resulting from the Site activities (operation of the Proposed Development and maintenance activities) and road traffic exhaust emissions during operation	Operation	Given the nature of the Proposed Development, no site activities resulting in significant emissions to air are anticipated during operation and there will only be limited movement of vehicles to the Site for maintenance. The potential impacts of dust and particulate matter emissions and traffic exhaust emissions are unlikely to be significant.

6.1.10 Opportunities for enhancing the environment

The Proposed Development will produce energy from the sun, which is a clean, sustainable source of energy. It will help to reduce the energy requirements from fossil fuels, which will emit harmful air emissions, such as carbon dioxide, nitrogen dioxide, sulphur dioxide, and particulate matters.

6.1.11 Proposed assessment methodology

Construction and decommissioning

The potential construction and decommissioning activities will be assessed and reported within the PEIR and ES.

Dust and particulate matter emissions

An assessment of the likely significant effects of construction phase dust and particulate matter at sensitive receptors will be undertaken following the IAQM's guidance note 'Assessment of dust from demolition and construction v2.1' (IAQM, 2023), using the available information from the project team and professional judgement.

The assessment will consider the risk of potential dust and particulate matter effects from the following three sources: earthworks; general site activities; and trackout. It will take into account the nature and scale of the activities undertaken for each source and the sensitivity of the area to increases in dust and particulate matter levels to assign a level of risk. Dust risks will be described in terms of low, medium or high. Once the level of risk has been ascertained, the site-specific mitigation proportionate to the level of risk will be identified, and the significance of residual effects determined.

Traffic exhaust emissions

A screening level qualitative assessment will be undertaken with reference to the Environmental Protection (UK) and IAQM guidance entitled 'Land-Use Planning & Development Control: Planning for Air Quality' (Moorcroft *et al*., 2017), using professional judgement and by considering the following information, where available:

- The number and type of road traffic and site equipment likely to be generated;
- The number and proximity of sensitive receptors to the Site and along the likely routes to be used by construction vehicles; and

- The likely duration and the nature of the construction/decommissioning activities undertaken.

6.1.12 Difficulties and uncertainties

No difficulties or uncertainties with regards the air quality assessment have been identified at this stage. It is assumed that development traffic flows during construction phase will be below the relevant criteria at this stage. The Applicant will be able to confirm whether a detailed construction phase traffic emissions modelling assessment is required following a review of the relevant traffic data at a later stage.

6.1.13 References

- Institute of Air Quality Management (2023) 'Guidance of the Assessment of dust from demolition and construction, v2.1' [pdf] Available at: https://iaqm.co.uk/wp-content/uploads/2013/02/Construction-dust-2023-BG-v6-amendments.pdf
- Department of Environment, Food and Rural Affairs. UK-AIR Air Information Resource. [online] Available at: http://uk-air.defra.gov.uk
- Department of Environment, Food and Rural Affairs (2022), Part IV of the Environment Act 1995 as amended by the Environment Act 2021: Local Air Quality Management: Technical Guidance LAQM.TG(22), London: Crown
- Moorcroft et al., (2017), 'Land-Use Planning & Development Control: Planning for Air Quality v1.2, Environmental Protection and Institute of Air Quality Management, London

6.1.14 Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of further assessment?
- Do you agree with the proposed factor-specific assessment approach?

6.2 Biodiversity

6.2.1 Consultation

No consultation with East Riding of Yorkshire Council to inform the biodiversity assessment has been undertaken to date. Consultation will be undertaken with East Riding of Yorkshire Council to agree the assessment methodology and biodiversity assets of sufficient importance to be considered in the EIA.

Pre-application consultation has been undertaken with Natural England. Natural England considers that the Proposed Development has the potential to impact on birds using functionally linked land associated with the Humber Estuary Special Protection Area (SPA) and Ramsar site. Natural England advises that the potential for loss of functionally linked land and/or construction/operational impacts on birds on functionally linked land should be considered in assessing what, if any, potential impacts the Proposed Development may have on European sites. Natural England considers that targeted bird surveys may be required to aid in this assessment.

6.2.2 Study area

The survey/assessment study area includes the Site and appropriate buffer zones, which varies per receptor as discussed below:

- Background data searches for statutory and non-statutory designated sites and protected species records will focus on the Site and a 1 km buffer, extended to 2 km for Sites of Special Scientific Interest (SSSIs) and 10 km for SPAs, Special Areas of Conservation (SACs) and Ramsar sites. Therefore, the Site and 2 km surrounding it is considered to be the primary Zone of Influence (ZoI), extended to 10 km when considering effects on European sites.
- The survey study area for the Preliminary Ecological Appraisal (PEA) is the entire Site (see **Appendix F**).
- The survey study area for great crested newts (GCN) is the entire Site and a 500 m buffer.
- The survey study area for bat activity is the entire Site.
- The survey study area for breeding birds is the entire Site, due to the need to assess the overall significance of the breeding bird assemblage present and inform potential enhancement measures (see Natural England comment in **Section 6.2.1** above).
- The survey study area for preliminary bat roost assessments is all trees and structures within the Site.
- If the design of the Proposed Development determines that any small sections of watercourse will be directly impacted, e.g. culverted to allow for cable installation, then water vole and otter surveys will be undertaken in, and adjacent to, the works area, for up to 100 m upstream and downstream, where accessible. Adjacent waterbodies would be included to account for any effects that may extend beyond the Site boundary. A survey area of 100 m upstream and downstream is proposed as this distance would account for any local water vole

populations that could commute further along the watercourse, into the Site boundary (Dean *et al*., 2016).

- The survey study area for considering reptile suitability is the entire Site.
- The survey study area for hedgerows and invasive species will comprise all the proposed works areas within the Site, including those where ancillary works will occur, as only direct impacts to these habitats/species need to be considered.
- The survey study area for badgers is the entire Site.

6.2.3 Data sources to inform the EIA baseline characterisation

The proposed assessment scope has been based on:

- A background data search from North and East Yorkshire Ecological Data Centre, which included a search for designated sites and protected species records within 1 km of the Site, extended to 2 km for SSSIs and 10 km for SPAs, SACs and Ramsar sites.
- Ecology surveys undertaken in 2021-2023 (see **Section 0** below for more details).

6.2.4 Surveys to inform the EIA baseline characterisation

The following surveys of the Site have been undertaken between 2021 and 2023, noting that the proposed cable route/corridor has not been finalised and therefore has not been surveyed to date but will be considered in future surveys (see below).

- A PEA walkover survey of the Site (excluding the cable route/corridor), carried out in August and September 2023 (see **Appendix F**);
- A reptile habitat suitability survey of the Site (excluding the cable route/corridor), undertaken during the PEA survey in August and September 2023;
- Habitat Suitability Index (HSI) and GCN eDNA survey of ponds within the Site (excluding the cable route/corridor), undertaken in June 2023;
- Preliminary bat roost assessment of trees and structures within the Site (excluding the cable route/corridor), undertaken on 8-22 August and 4 September 2023;
- Bat activity surveys (static monitoring), undertaken in June 2023 and September 2023. This involved deployment of static bat detectors in various habitat types across the Site and Site boundaries (excluding the cable route/corridor); and
- Ornithology surveys (breeding and non-breeding season) of the Site (excluding the cable route/corridor), undertaken between 2021 and 2023.

The following surveys are anticipated to be undertaken in 2023/2024:

- For the cable route/corridor, a PEA survey, including reptile habitat suitability, preliminary bat roost assessment of trees/structures and GCN HSI/eDNA survey of ponds;
- Water vole and otter surveys, once watercourse crossing points are confirmed;
- Further bat activity surveys (static monitoring) in Spring 2024 (within the Site and along the cable route/corridor);

- Further targeted non-breeding bird surveys including nocturnal surveys;
- Badger survey (within the Site and along the cable route/corridor);
- Hedgerow survey (if required) - any species-rich hedgerow that is due to have sections removed (whether permanently or temporarily) would be subject to further hedgerow survey to assess its ecological importance under the Hedgerows Regulations 1997, as well as to help inform mitigation and enhancement ; and
- Bat roost surveys (if required) – hibernation surveys, internal building inspections (if access facilitated), endoscope inspections, tree climbing and emergence surveys. These will only occur if any trees and/or structures could potentially be directly or indirectly impacted by the construction of the Proposed Development and/or the cable route/corridor, although it is currently envisaged this will not occur.

In addition to the above, further targeted bird surveys may be required. This will be determined following review of the existing survey data.

6.2.5 Baseline conditions

The existing ecological baseline is based on both desk and field-based studies undertaken to date (see **Sections 0** and **0** above).

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

The fields are bordered by a mix of hedgerows, wet ditches and some of the many major, named drains and dikes in the area.

The River Hull runs close to the western edges of the Site. The North Sea and Humber Estuary lie 10 km to the east and south, respectively.

A more detailed description of the Site is provided in **Chapter 2**.

The following habitat types with respective UK habitat codes, were recorded as present on and adjacent to the Site during the PEA survey undertaken in August and September 2023 (see **Appendix F**):

- Built linear features (u1e);
- Cropland (c1);
- Modified grassland (g4);
- Other neutral grassland (g3c);
- Woodland (w);
- Lines of trees (w1g6);
- Hedgerows (h2);
- Dense scrub (h3); and
- Standing open water and ditches (r1g).

Statutory designated sites

International statutory sites

There are no international statutory sites within the Site boundary. There are five international statutory designations covering three sites within 10 km of the Site boundary:

- Hornsea Mere SPA (5.8 km east). The only remaining mere in Holderness, Humberside and only major freshwater body for wintering ducks in a wide area. It consists of a large, shallow, eutrophic lake of 120 ha with associated fen, carr woodland and reedswamp. It is designated for regularly supporting internationally important wintering populations of gadwall (*Anas strepera*) and a nationally important population of mute swan (*Cygnus olor*). Wintering populations of goldeneye (*Bucephala clangula*), pochard (*Aythya farina*), shoveler (*Anas clypeata*) and tufted duck (*Aythya fuligula*) are also mentioned.
- Humber Estuary Ramsar/SPA/SAC (9.3 km south). The Humber Estuary is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. The range of habitats on the Estuary support a large variety of wintering, passage and breeding birds, including internationally important populations of a number of species. Birds are widely distributed throughout the site. Adjacent inland terrestrial sites areas are used extensively as high tide roosts and also provide important supporting habitats for SPA bird species. The qualifying species are:
  - Breeding and non-breeding: Great bittern (*Botaurus stellaris*), Pied avocet (*Recurvirostra avosetta*)
  - Breeding: Eurasian marsh harrier (*Circus aeruginosus*), Little tern (*Sterna albifrons*)
  - Non-breeding: Common shelduck (*Tadorna tadorna*), Hen harrier (*Circus cyaneus*), European golden plover (*Pluvialis apricaria*), Red knot (*Calidris canutus*), Dunlin (*Calidris alpina alpina*), Ruff (*Philomachus pugnax),* Black-tailed godwit (*Limosa limosa islandica*), Bar-tailed godwit (*Limosa lapponica*), Common redshank (*Tringa totanus*); and
- Greater Wash SPA (9.6 km east). The Greater Wash SPA was designated in 2018 to protect important areas of sea used by waterbirds during the non-breeding period, and for foraging in the breeding season. This site is designated for three non-breeding species: red-throated diver (*Gavia stellata*), little gull (*Hydrocoloeus minutus*) and common scoter (*Melanitta nigra*). The SPA provides important habitat for these species including shallow sandbanks and other sandy substrates. This site is also designated for three breeding tern species: sandwich tern (*Sterna sandvicencis*), little tern (*Sternula albifrons*) and common tern (*Sterna hirundo*). During the breeding season populations of all three of these tern species forage within the Greater Wash SPA.

National statutory sites

There are no national statutory sites within the Site boundary. There are two national statutory designated sites within 2 km of the Site boundary:

- Tophill Low SSSI (365 m north of Land Area A); and

- Leven Canal SSSI (865 m south of Land Area A).

Non-statutory designated sites

There are no non-statutory designated sites within the Site boundary. There are seven non-statutory designed sites (LWS) within 1 km of the Site boundary:

- Cote Wood LWS (borders the eastern edge of Land Area D);
- Meaux LWS (35 m north of Land Area F);
- Tophill Low LWS (60 m north of Land Area A);
- Arnold Drain LWS (70 m south of Land Area C);
- Watton Carr LWS (125 m north of Land Area A);
- Easingwold Farm (Historic LWS) (525 m north of Land Area A); and
- Figham Pastures LWS (530 m west of Land Area E).

Other notable sites

There is one area of ancient semi-natural woodland within 1 km of the Site boundary, namely Cote Wood (LWS), which borders the edge of Land Area D.

Other priority habitats which are ostensibly within or adjacent to the Site include areas of priority habitat being deciduous woodland (in Land Areas D and E) and areas of floodplain grazing marsh to the south-west of the Site (particularly Field E16, and also around Field E6, though the latter is now clearly cropland).

Protected and noteworthy species records

The background data search returned 464 records of 82 species recorded between 1973 and 2019 within 1 km of the Site. Noteworthy species include species of principal importance that are listed under Section 41 of The Natural Environment and Rural Communities (NERC) Act 2006.

Of these, 27 species are birds, two are fish, 16 are invertebrates (all Lepidoptera), eight are mammals (of which three are bats), 24 are plants (almost half being aquatic/marginal species), one is a reptile, and three are amphibians.

Protected and notable species

Invertebrates

The background data search returned records of 16 notable invertebrate species within 1 km of the Site, 15 of which are Section 41 species.

Habitat present within the Site were considered likely to support only a common assemblage of invertebrate species, typical of hedgerows, scrub, plantation woodlands, and species-poor grasslands. The network of ditches may support a notable aquatic invertebrate fauna, but as suitable buffer zones between watercourses and development and pollution prevention control measures will be implemented, no direct impacts on aquatic fauna are envisaged. It is therefore considered that further invertebrate surveys will not be required.

Fish

The background data search returned records of two fish species within 1 km of the Site: European eel (*Anguilla anguilla*) and brown/sea trout (*Salmo Trutta*).

The watercourses within the Site are small and of relatively poor quality, though they do connect with watercourses that are tributaries of the River Hull.

Amphibians

The background data search returned records of GCN within 1 km of the Site.

The Site is mostly arable with occasional parcels of improved or species-poor semi-improved grassland, which is generally poor suitability terrestrial habitat for GCN.

All of the three ponds and seven of the 11 ditches that were eDNA analysed were negative; the remaining four ditches were indeterminate, so GCN are considered likely absent.

The background data search returned records of two common amphibian species within 1 km of the Site: Common toad (*Bufo bufo*) and common frog (*Rana temporaria*).

The watercourses/waterbodies within the Site are suitable to support these species.

Reptiles

The background data search returned records of grass snake (*Natrix helvetica*) within 1 km of the Site.

Most of the Site is unsuitable for reptiles, comprising large areas of monoculture arable land. However, connecting areas of woodland, scrub, hedgerow bases, rough grassland and spoil heaps/log piles could support low numbers of common reptiles.

Birds

The background data search returned records of 27 bird species within 1 km of the Site.

Seven are listed in Schedule 1 of the Wildlife and Countryside Act 1981 (as amended): greylag goose (*Anser anser*), goldeneye (*Bucephala clangula*), Cetti's warbler (*Cettia cetti*), hobby (*Falco subbuteo*), whimbrel (*Numenius phaeopus*), green sandpiper (*Tringa ochropus*) and barn owl (*Tyto alba*).

Five are listed in Section 41 of the NERC Act 2006: skylark (*Aluda arvensis*), yellowhammer (*Emberiza citrinella*), reed bunting (*Emberiza schoeniclus*), curlew (*Numenius arquata*) and lapwing (*Vanellus vanellus*).

Eight species are included on the red list of Birds of Conservation Concern (some species are on more than one list): goldeneye, whimbrel, skylark, yellowhammer, curlew, red-necked grebe (*Podiceps grisegena*), woodcock (*Scolopax rusticola*) and lapwing.

Thirteen are included on the amber list of Birds of Conservation Concern: green sandpiper, teal (*Anas crecca*), mallard (*Anas platyrhynchos*), pink-footed goose (*Answer brachyrhynchus*), reed bunting, kestrel (*Falco tinnunculus*), snipe (*Gallinago gallinago*), moorhen (*Gallinula chloropus*) oystercatcher (*Haematopus ostralegus*), willow warbler (*Phylloscopus trochilus*), shelduck (*Tadorna tadorna*), redshank (*Tringa totanus*) and wren (*Troglodytes troglodytes*).

The Site contains suitable habitat for ground-nesting birds. Twenty-three breeding (or suspected breeding) notable species were recorded within the Site. The most abundant of these species were skylark (59 pairs), wren (43 pairs), whitethroat (44 pairs), yellowhammer (32 pairs) and reed bunting (35 pairs). This breeding bird assemblage comprised nine red list species, 13 amber list species and one Schedule 1 species.

The non-breeding bird surveys completed in winter 2021-22 and 2022-23 recorded a flock of 800 golden plover (a species mentioned in the Humber Estuary SPA), and flocks of 290 and 110 common gulls and black-headed gulls, respectively all within the Site.

Bats

The background data search returned records of whiskered bat (*Myotis mystacinus*), common pipistrelle (*Pipistrellus pipistrellus*) and brown long-eared bat (*Plecotus auritus*) within 1 km of the Site.

Ground level tree assessments have been completed within the Site and the results are currently being compiled. The static monitoring of the Site completed to date is in the process of being analysed and has only shown an assemblage of more common bat species so far.

Hazel dormice

There are no known records of hazel dormice within 1 km of the Site. Hedgerows within the Site were considered to provide some suitability for hazel dormice, although many were species-poor, and woodland was generally sparse so foraging opportunities were limited. Therefore, hazel dormice are considered to be absent.

Water voles and otters

The background data search returned records of water vole or otter within 1 km of the Site.

Several of the streams and ditches within the Site provide suitable habitat for water voles. The watercourses are likely to be too small for otter, though they may be used for foraging and individuals commuting as part of a much larger territory or home range.

Badgers

The background data search returned records of badger within 1 km of the Site.

Other species

The background data search returned records of brown hare (*Lepus europaeus*), western European hedgehog (*Erinaceus europaeus*) and harvest mouse (*Micromys minutus*) within 1 km of the Site.

The PEA did not record these species within the Site; however, habitats within the Site, including log piles, scrub, woodland and grassland, were considered suitable to support them.

6.2.6 Additional (secondary and tertiary) mitigation

Construction

- Production and implementation of the Outline Landscape and Ecological Management Plan that will offset significant effects on legally protected species whilst also delivering a significant gain in biodiversity. The Outline Landscape and Ecological Management Plan will consider the recommendations outlined in **Appendix F**;
- Production and implementation of an Outline Construction Environmental Management Plan to include measures to safeguard ecological receptors during construction, as outlined in **Appendix F**;
- Pre-construction badger survey;
- Survey of any trees with potential to support roosting bats if they require felling; and
- Bat licence (if required).

Operation

- Continued adherence to, and implementation of, the Outline Landscape and Ecological Management Plan and Outline Operational Environmental Management Plan.

Decommissioning

- The potential impacts from decommissioning (removal of solar modules) will be similar to the potential impacts during construction. The Outline Decommissioning Environmental Management Plan will include measures to safeguard ecological receptors during decommissioning; and
- Pre-decommission badger survey.

6.2.7 Description of likely significant effects

Habitat loss/degradation

Although construction of the two on-site substations, BESS and associated compounds would result in modification of habitat during the construction and operational phase and the installation of solar modules could cause habitat degradation of grassland during the operational phase, i.e. by creating dominance of shade tolerant species, mitigation is proposed so that significant effects would not occur (refer to **Section 0** below). However, the value of habitats on the land yet to be surveyed (cable route) (refer to **Section 0** above) is currently unknown so a full assessment of potential impacts of the cable route/corridor will be undertaken once the route/corridor has been subject to habitat survey.

International Designated Sites

Some of the fields will provide habitat suitable for bird species associated with the Humber SPA and Ramsar site, Hornsea Mere SPA and Greater Wash SPA and could therefore be functionally linked to these sites. The bird survey data is currently being reviewed to determine if this is the case, with additional wintering survey ongoing to aid the assessment.

Ground nesting birds

Much of the Site, being large open arable and grassland fields, is suitable for ground nesting birds. Open fields, with good long-range visibility, are important for ground nesting birds. The construction and operation of the Proposed Development would cause a loss of habitat for ground nesting birds. In the absence of mitigation, there could be significant long-term effect.

Bats (foraging and commuting)

Much of the Site, being large open arable and grassland fields with hedgerows and ditches, is suitable for foraging and commuting bats. Recent published evidence indicates that for some foraging bat species, solar panels have a displacement effect. The construction and operation of the Proposed Development may directly impact upon foraging/commuting bats. There could be a significant long-term effect if significant numbers of bats are found to use the Site; however, appropriate mitigation would be proposed if this was considered to be the case.

6.2.8 Receptors/matters to be scoped into further assessment		
Receptor/Matter	**Phase**	**Justification**
Hornsea Mere SPA Humber Estuary Ramsar/SPA Greater Wash SPA	Construction, operation and decommissioning	These sites are avoided by the current Proposed Development design and will be subject to a Habitats Regulations Assessment. This will outline the mitigation required to ensure that the Proposed Development does not have a significant indirect effect on these protected sites or the species associated with them at any stage of the development. However, the farmland within the Site may form functionally linked land associated with these SPAs and so further survey/assessment will be required to assess their conservation importance. The likely significant effect would be disturbance and displacement of birds, should significant numbers of bird species associated with the SPAs be regularly utilising the fields within the Site boundary.
Tophill Low SSSI	Construction and decommissioning	Tophill Low SSSI is located 365 m north of Land Area A and is designated for wintering wildfowl; potential noise impacts as a result of construction and decommissioning activities therefore require further investigation.
Habitats - cable route	Construction, operation and decommissioning	The cable route has not yet been finalised or surveyed and therefore the habitats have not been assessed. These areas will need to be surveyed to assess their conservation importance. Therefore, habitats along the cable route are scoped into further assessment on a precautionary basis. Depending on the results of the survey, habitats along the cable route will likely be scoped out of further assessment within the PEIR/ES.
Ground nesting birds	Construction and decommissioning	Much of the Site, being large open fields, is suitable to support ground nesting birds. Construction and decommissioning would cause loss of breeding habitat and directly impact upon these species. The results of

		the surveys undertaken in 2023 will determine the importance of the breeding bird assemblage present and inform the design of the Proposed Development and any mitigation to provide continued availability for open space for ground nesting birds and food supply during breeding and wintering periods.
Bats – foraging/commuting	Construction, operation and decommissioning	Much of the Site, being large open fields with hedgerows and ditches, is suitable for foraging/commuting bats. Construction and decommissioning would modify habitat and during the operation, the presence of solar modules may displace some foraging bat species. Surveys undertaken in 2023 and 2024 will determine the importance of the bat assemblage present and inform the design of the Proposed Development and any mitigation to provide continued availability of habitat for foraging/commuting bats.

6.2.9 Receptors/matters to be scoped out of further assessment

Receptor/Matter	Phase	Justification
Humber Estuary SAC	Construction, operation and decommissioning	This site does not lie within the Site boundary and is a sufficient distance from the Site that no significant effects are considered likely. The site will be protected by measures included in the Outline Construction Environmental Management Plan, the Outline Operational Environmental Management Plan and the Outline Decommissioning Environmental Management Plan.
Tophill Low SSSI	Operation	This site does not lie within the Site boundary. Any noise emitted from the operational Proposed Development would be continuous in nature, leading to minimal disturbance on the wintering wildfowl for which this site is designated. Furthermore, it is considered that over time, the birds would habituate to any noise emissions.

Leven Canal SSSI	Construction, operation and decommissioning	These sites do not lie within the Site boundary and will be protected by the Outline Construction Environmental Management Plan, the Outline Operational Environmental Management Plan and the Outline Decommissioning Environmental Management Plan.
Cote Wood LWS (semi-natural ancient woodland)	Construction, operation and decommissioning	These sites do not lie within the Site boundary, though Cote Wood LWS is adjacent to it. They will be protected by the Outline Construction Environmental Management Plan, the Outline Operational Environmental Management Plan and the Outline Decommissioning Environmental Management Plan.
Meaux LWS		
Tophill Low LWS		
Arnold Drain LWS		
Watton Carr LWS		
Easingwold Farm LWS		
Figham Pastures LWS		
Hedgerows and hedgerow trees	Construction, operation and decommissioning	The Proposed Development will be designed to include a buffer from solar modules to boundary features including hedgerows and trees and measures in the Outline Construction Environmental Management Plan will safeguard their protection. Mitigation for any habitat loss will be included in the Outline Landscape and Ecological Management Plan.
Ditches/ponds	Construction, operation and decommissioning	No ditches or ponds will be lost to the Proposed Development. The Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan will include standard practice pollution prevention measures to protect the ditches within and adjacent to the Site.

Grassland	Construction, operation and decommissioning	No botanically diverse areas of grassland will be lost to accommodate the Proposed Development. The Outline Landscape and Ecological Management Plan will include measures to sufficiently compensate for any minor habitat loss and to protect any retained areas of this habitat during construction.
Woodland	Construction, operation and decommissioning	The design of the Proposed Development will retain all woodland areas and the Outline Landscape and Ecological Management Plan will include measures to protect any retained areas of this habitat during construction.
Scrub	Construction, operation and decommissioning	The design of the Proposed Development will retain scrub, but should any minor habitat clearance be required (considered unlikely), the Outline Landscape and Ecological Management Plan will include measures to sufficiently compensate for habitat loss and to protect any retained areas of this habitat during construction.
Reedbed	Construction, operation and decommissioning	The design of the Proposed Development will not involve any direct loss of ditches or associated reedbed habitat. The Outline Landscape and Ecological Management Plan will include measures to sufficiently compensate for any minor habitat loss should this be required and to protect any retained areas of this habitat during construction.
Invasive species	Construction, operation and decommissioning	No invasive species were identified during the PEA survey. If any are found during further survey, then an invasive species method statement, which would be included in the Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan, will be implemented to prevent the spread of this species during construction.

Invertebrates	Construction, operation and decommissioning	Due to a lack of records of Schedule 5 species together with the lack of high-quality habitat within the Site that could support an important invertebrate assemblage.
Amphibians	Construction, operation and decommissioning	The background data search returned records of GCN within 1 km of the Site. The Site is mostly arable with occasional parcels of improved or species-poor semi-improved grassland, which is generally poor suitability terrestrial habitat for GCN. All of the three ponds and seven of the 11 ditches that were eDNA analysed were negative; the remaining four ditches were indeterminate, so GCN are considered likely absent. The background data search returned records of two common amphibian species within 1 km of the Site: Common toad and common frog. The watercourses/waterbodies within the Site are suitable to support these species. However, there will be no direct loss of waterbody breeding habitat and precautionary measures detailed in the Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan will safeguard amphibians that may be present.
Reptiles	Construction, operation and decommissioning	The Site, being mostly arable and improved pasture, is largely unsuitable for reptiles. Precautionary measures detailed in the Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan will safeguard low numbers of reptiles that may be present in the more suitable areas.
Ground nesting birds	Operation	Biodiversity enhancement measures will sufficiently support ground nesting birds to ensure there are no likely significant effects during operation. In addition, enhancement

		measures will ensure suitable foraging conditions are maintained.
Non-ground nesting birds	Construction, operation and decommissioning	Retention of boundary hedgerows and trees and implementation of precautionary measures detailed in the Outline Construction Environmental Management Plan and Outline Decommissioning Environmental Management Plan will sufficiently safeguard nests during construction and decommissioning. Enhancement measures will enhance foraging for all nesting bird species. No significant effects are anticipated during operation.
Wintering birds not associated with SPA or Ramsar sites	Construction, operation and decommissioning	If wintering birds are utilising the Site, then they may be disturbed and displaced by construction and decommissioning activities. However, this will be mitigated by the implementation of precautionary measures detailed in the Outline Construction Environmental Management Plan and the Outline Decommissioning Environmental Management Plan, which will sufficiently safeguard birds during construction and decommissioning. There is not expected to be loss of foraging habitat as boundary features will be enhanced and other habitat creation and enhancement works secured through the Outline Landscape and Ecological Management Plan is likely to benefit wintering birds. No effects are anticipated during operation.
Barn owl	Construction, operation and decommissioning	If nesting barn owl are present in trees or barns adjacent to works, they may be disturbed by construction and decommissioning activities. However, this will be mitigated by buffer zones between the solar modules and boundary features. There is not expected to be loss of foraging habitat as boundary features will be enhanced and other habitat creation and enhancement works secured through the Outline Landscape and Ecological Management Plan is likely to benefit foraging barn owls.

		There are not expected to be any significant effects during operation.
Marsh harrier	Construction, operation and decommissioning	Marsh harrier were recorded in close proximity to the Site. If marsh harrier are nesting in wetland vegetation, or field margins, they may be disturbed by construction and decommissioning activities. However, this will be mitigated by buffer zones and measures detailed within the Outline Construction Environmental Management Plan, the Outline Decommissioning Environmental Management Plan and the Outline Landscape and Ecological Management Plan. There is not expected to be a loss of foraging habitat and marsh harriers mostly hunt along filed margins. Boundary features will be enhanced and other habitat creation and enhancement works secured through the Outline Landscape and Ecological Management Plan is likely to benefit foraging marsh harrier. There are not expected to be any significant effects during operation.
Bats – roosting	Construction, operation and decommissioning	If bats are roosting in trees or barns adjacent to works, then they may be disturbed by construction and decommissioning activities. However, this will be mitigated by retention of such features, buffer zones (works buffer from hedgerows and trees) and measures detailed within the Outline Construction Environmental Management Plan, the Outline Decommissioning Environmental Management Plan and the Outline Landscape and Ecological Management Plan. The operation of the Proposed Development would have no impact on roosting bats.
Hazel dormice	Construction, operation and decommissioning	There are no known records of hazel dormice within 1 km of the Site. Hedgerows within the Site were considered to provide some suitability for hazel dormice, although many were species-poor, and woodland

		was generally sparse, so foraging opportunities were limited. Therefore, hazel dormice are considered to be absent.
Water vole	Construction, operation and decommissioning	No watercourses will be lost to the Proposed Development. If small sections of watercourses are affected (e.g. culverted to allow for installation of cables), then survey work will be carried out to determine if water voles are present. If present, standard mitigation measures will be implemented under a licence from Natural England. The Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan will include standard practice pollution prevention measures to protect the watercourses within and adjacent to the Site.
Otter	Construction, operation and decommissioning	No watercourses will be lost to the Proposed Development. If small sections of watercourses are affected (e.g. culverted to allow for installation of cables), then survey work will be carried out to determine if any holts or lying up sites are present. If such features are present and actively occupied, standard mitigation measures will be agreed with Natural England implemented under licence. The Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan will include standard practice pollution prevention measures to protect the watercourses within and adjacent to the Site.
Fish	Construction, operation and decommissioning	No watercourses will be lost to the Proposed Development. If small sections of watercourses are affected (e.g. culverted to allow for installation of cables), then standard mitigation measures such as fish rescue will be implemented. The Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline

		Decommissioning Environmental Management Plan will include standard practice pollution prevention measures to protect the watercourses within and adjacent to the Site.
Badger	Construction, operation and decommissioning	All known setts will be retained with an appropriate buffer. Implementation of precautionary measures detailed in the Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan will mitigate for any residual risk.

6.2.10 Opportunities for enhancing the environment

Opportunities for ecological enhancement within the Site are diverse due to the number of different habitats present and their generally low biodiversity value, being intensively farmed. No specific enhancement measures have yet been agreed.

However, a detailed biodiversity design will be produced and implemented outlining how a substantial net gain in biodiversity will be achieved. The biodiversity design will be cognisant of local biodiversity priorities already identified and priorities emerging from the developing East Riding of Yorkshire Local Biodiversity Action Plan.

These measures will focus on compensating for potential adverse effects on habitats and species already known to be on the Site, and to improve the Site for species that could feasibly colonise in the future given the surrounding landscape. Therefore, enhancement measures could include some of the following:

- Creation of flower-rich grassland and herbal 'ley' habitat or similar underneath and between solar modules to restore soil health and create a nectar source for invertebrates - in particular pollinators and provide foraging for bat and bird species.
- New hedgerow planting (primarily for screening) and reinforcing existing hedgerow network where appropriate.
- Enhancement of field boundaries and footpaths to provide greater habitat connectivity and increased habitat for invertebrates.
- Winter food for farmland birds – leaving over winter stubbles and or provision of specific seed source within buffer strip margins between solar modules and boundary features.
- Ensuring any fencing is permeable to mammal species such as badger, brown hare and hedgehog. Allowing the movement of deer across the wider landscape will also be considered.
- Creation and enhancement of floodplain grassland – new floodplain grassland would buffer and extend the area of species-rich grassland (the LWSs) whilst

providing nesting and foraging habitat for ground nesting birds, foraging bats and other species.

- Creation of habitat suitable for wintering birds associated with the Humber Ramsar site and SPA, should review of bird data indicate presence of functionally linked land.
- Creation of wetland areas in low lying areas of the Site, providing increased habitat for biodiversity, run-off capture and improved water quality, flood alleviation in the wider catchment and which will provide additional foraging and nesting habitat for bird species.

6.2.11 Proposed assessment methodology

The ecological impact assessment (EcIA) will follow the Chartered Institute of Ecology and Environmental Management's (CIEEM) Guidelines for Ecological Impact Assessment in the UK and Ireland (CIEEM, 2018) (Version 1.2 - Updated April 2022).

The significance criteria proposed for the biodiversity assessment is presented in **Appendix D**.

6.2.12 Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- The proposed cable route has not yet been surveyed. As outlined in **Section 0** above, these areas will be subject to survey in 2023/2024.
- Some species-specific surveys have not yet been completed or undertaken. As stated in **Section 0** above, these will be completed/undertaken in 2023 and 2024.
- The bat sound analysis undertaken to date has been used to inform this EIA Scoping Report. Only more common species of bats and fairly low numbers have been recorded to date. If any of the rarer species are identified in the outstanding analysis, they would not change the assessment scope or mitigation requirements. Sounds analysis will be completed prior to further stages of the assessment. For these reasons, this uncertainty will not affect the ability to undertake this assessment, nor its conclusions.
- The bird survey data is currently being assessed to understand the potential for impacts on nearby SPA and Ramsar sites. This is to inform the Habitats Regulations Assessment and to determine the type of mitigation required, if any. This uncertainty will not affect the ability to undertake this assessment, nor its conclusions.

6.2.13 References

- CIEEM (2018), *Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine* (Winchester: CIEEM). Version 1.2 - Updated April 2022.

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- The British Standards Institution (2013), 'BS 42020:2013 Biodiversity – Code of practice for planning and development', BSI Standards Limited

6.2.14 Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?

- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of further assessment?
- Do you agree with the proposed factor-specific assessment approach?

6.3 Climate

6.3.1 Consultation

No consultation to inform the climate assessment has been undertaken to date and no specific consultation in relation to the climate assessment is envisaged, over and above the consideration of comments received to this EIA Scoping Report.

6.3.2 Study area

The study area is defined as the area within the Site boundary for climate change mitigation (i.e., assessment of greenhouse gas (GHG) emissions from the Proposed Development). Within the GHG assessment, scope 1 emissions will include those emitted directly from all facilities and infrastructure under the operational control of the Proposed Development, and likely within the Site boundary. However, scope 2 and any relevant scope 3 emissions will occur outside the proposed Site boundary (i.e., globally). These emissions will be estimated based upon project-specific data that may relate to activities outside the Site boundary (e.g., water provision and wastewater treatment outside of the Site boundary, or the embodied carbon within construction materials and solar PV modules as a result of the energy used for production).

The receptor to GHG emissions is the global climate, and so when assessing the potential impact and significance of GHG emissions the national (Climate Change Act 2008 and associated Carbon Budgets) and global context (Paris Agreement) is considered.

6.3.3 Data sources to inform the EIA baseline characterisation

Standard emission factors will be applied, sourced from reputable agencies, such as the Department for Energy Security and Net Zero UK Government GHG Conversion Factors for Company Reporting (2023a). The national GHG baseline data will be obtained from the UK Government (BEIS, 2022).

This assessment will consider the East Riding of Yorkshire Council's target of achieving net zero by 2050 for their own operations and services as well as the development of a shared area-wide net zero target, as set out within their Climate Change Strategy for 2022 – 2030.

Flood risk at the Site has been assessed using the UK Government's flood map for planning tool (2023), which ranks an areas flood risk probability on a scale of low, medium and high.

Data pertaining to the expected construction and operational activities will be sourced from the Applicant to estimate applicable scope 1, 2 and 3 emissions. This includes construction energy consumption, expected maintenance requirements, product specification (e.g., solar PV modules and BESS), total materials needed for construction and details on construction workforce.

6.3.4 Surveys to inform the EIA baseline characterisation

No surveys have been undertaken to date, and none are expected to be undertaken to inform the climate assessment.

6.3.5 Baseline conditions

The baseline conditions describe the conditions of a business-as-usual scenario whereby the Proposed Development is not undertaken. The baseline comprises existing carbon stock and sources of GHG emissions within the Site boundary of the existing activities on-site.

The Site is split into various Land Areas which predominantly consist of agricultural fields, hedgerows and mature trees. Much of the Site falls within Flood Zone 3 based on the UK Government's flood map (2023). Flood Zone 3 indicates an area has a high probability of flooding, defined as a 1% or greater annual probability of river or sea flooding.

With regards to the national baseline, the UK Government set out a legally binding framework to cut GHG emissions by at least 80% by 2050 in the Climate Change Act (2008); this was amended by the Climate Change Act 2008 (2050 Target Amendment) Order 2019, changing the 80% reduction to a 100% reduction, or net zero, by 2050.

The total UK GHG emissions for 2021 was 505 million tCO2e, up by 6% from the year before. Overall however, the trend of total UK GHG emissions shows a decreasing trajectory from 1990 to 2020. Emissions relating to 'Electricity, gas, steam and air conditioning supply' specifically show a significant reduction trend over the past decade, halving from 176 million tCO_2e in 2010 to 81 million tCO_2e in 2020 (BEIS, 2022).

6.3.6 Additional (secondary and tertiary) mitigation

Construction

The generation of GHG emissions is inevitable due to construction activities. Embodied GHG emissions will also be present due to production of solar modules and associated infrastructure. An Outline Construction Environmental Management Plan will be implemented to identify good working practices in line with appropriate standards, including low carbon practices. Some mitigation measures that are anticipated to be taken account of are:

- Embed carbon reduction practices as a core principle for the design team. Where reduction ideas are suggested, they should be recorded and the potential impact quantified. Earlier engagement with carbon reduction allows for the greatest returns.
- Where technical specifications allow, maximise the recycled content of construction materials such as concrete and steel.
- Maximise the specification of materials with an environmental product declaration with the aim of reducing embodied carbon emissions.
- Incentivise use of local suppliers with a view to shorten project supply chains and environmental footprint.
- On-site mobile and non-mobile plant should conform to the latest emissions standards, with mobile vehicles conforming to EURO 6 standards as a minimum. All plant should investigate the option of using HVO fuels or electric versions where possible.
- Require main contractors to report on energy data, water usage and waste disposal and their GHG emissions as part of the Outline Construction Environmental Management Plan.

Operation

The operation of the Proposed Development is anticipated to have a positive effect on the climate. Nonetheless, there is scope to further improve the Site in terms of ecological enhancements and habitat creation, which can have a positive effect in terms of carbon sequestration. These will be documented within, managed and secured by the Outline Landscape and Ecological Management Plan, as appropriate.

Decommissioning

The decommissioning process is likely to result in GHG emissions, particularly from waste disposal of solar PV modules and any BESS. Additional mitigation can be employed that aligns with the hierarchy for managing project-related emissions (avoid, reduce, substitute and compensate), which will be documented within the Outline Decommissioning Environmental Management Plan.

6.3.7 Description of likely significant effects

Construction

With regards to GHG emissions, the global climate is the sensitive receptor. During construction and product manufacture, there will be unavoidable GHG emissions that result in a negative effect on the stability of the global climate. The embodied carbon of solar PV modules and BESS can be relatively high when compared against other renewable energy technologies.

Operation

During operation, renewable energy will be generated, replacing fossil-based energy in the National Grid. This has the net effect of reducing GHG emissions generated elsewhere in the national energy supply chain. Given the proposed operational life of 40 years, the cumulative effect of these GHG reductions will likely provide significantly beneficial effects on the stability of the climate.

Decommissioning

Decommissioning activities will result in unavoidable GHG emissions, predominantly from transport and waste disposal activities. It is anticipated these may be as much as 20% of all GHG emissions from the Proposed Development.

6.3.8 Receptors/matters to be scoped into further assessment

Receptor/Matter	Phase	Justification
GHG emissions	Construction	It is important to include construction-related emissions when considering the overall lifecycle emissions of the Proposed Development. Important emissions sources to be assessed include the raw material extraction and manufacturing of products required to build the equipment for the Proposed Development, transportation of these materials to Site, on-site construction activity, travel of construction workers to Site and waste generated by the construction process.
GHG emissions	Operation	Given the proposed operational life of 40 years, the cumulative effect of GHG reductions associated with the operation of the Proposed Development will likely provide significant beneficial effects.
GHG emissions	Decommissioning	The decommissioning process is likely to result in GHG emissions, particularly from the disposal and transportation of waste. It is important to include all emissions when considering the overall lifecycle emissions of the Proposed Development. The IEMA 'Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance' (2022 edition) guidance requires all life cycle stages to be assessed assuming each stage contributes greater than 1% of total lifetime GHG emissions, which is likely to be the case for solar developments.

6.3.9 Receptors/matters to be scoped out of further assessment		
Receptor/Matter	**Phase**	**Justification**
In-combination impact assessment	Construction, operation and decommissioning	The resilience of receptors identified in other chapters is unlikely to be affected by a combination of future climate change (e.g., temperature change, sea level rise or wind), and the potential impacts of the Proposed Development. Given that the majority of the Site is located within Flood Zone 3, the potential in-combination impacts of heavy precipitation and the Proposed Development will be assessed in more technical detail within the Flood Risk Assessment to be submitted in support of the DCO application. Therefore, the in-combination impact assessment has been scoped out of the climate deliverables.
Climate resilience	Construction, operation and decommissioning	The UK Climate Projections published in 2018 (UKCP18) suggest that climate change will lead to hotter drier summers, warmer wetter winters, increased likelihood of extreme weather events (e.g., heat waves, high rainfall events) and sea-level rise. Due to the embedded resilience of solar PV modules to high heat and wind speeds, these factors are not expected to significantly impact on the construction, operation or decommissioning of the Proposed Development. Moreover, although the Site is located within Flood Zone 3, the risk of flooding will be assessed in more technical detail within the Flood Risk Assessment to be submitted in support of the DCO application.

6.3.10 Opportunities for enhancing the environment
The operational Proposed Development is expected to have a net beneficial impact on the climate, in that it will reduce GHG emissions associated with electricity consumption on a national scale. Opportunities will be explored to further increase the environmental benefit of the Proposed Development by seeking to reduce emissions associated with the construction and decommissioning processes where possible.

6.3.11 Proposed assessment methodology

The assessment of the effects of GHG emissions arising from the Proposed Development will be carried out in accordance with:

- The IEMA Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance (2022 edition);
- PAS 2080:2023 Carbon management in buildings and infrastructure; and
- Royal Institute of Chartered Surveys (RICS) Whole life carbon assessment for the built environment (2023).

The assessment will quantify applicable Kyoto Protocol GHGs as measured in tonnes of carbon dioxide equivalence (tCO_2e), where equivalence means having the same warming effect as CO_2 over 100 years.

The GHG baseline characterisation will be conducted using a desk-based assessment of current land use, existing carbon stock and any activities that could cause GHG emissions. However, in line with the IEMA Guide, any agricultural land can generally be considered to have zero baseline emissions to ensure reasonable worst-case approach to establishing net GHG effect.

Data associated with the activities contributing to the construction, operation and decommissioning of the Proposed Development will be provided by the Applicant. Where it is not possible to collect these data, as this assessment represents a forecast of emissions and some information may not yet be known, secondary data (such as estimates, extrapolations, benchmarks and proxy data such as distance travelled) will be used. Emissions will then be quantified by applying the most relevant and up-to date emission factors.

The significance criteria that will be applied in the assessment is set out in **Appendix D**.

6.3.12 Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- The accuracy of a GHG assessment depends on the quality of the data provided. Primary data should always be used where available. Where it is not possible to collect these data, as this assessment represents a forecast of emissions and some information may not yet be known, secondary data (such as estimates, extrapolations, benchmarks and proxy data such as distance travelled) will be used, based upon industry approximations and professional best practice. Assessments such as this, based largely on secondary data, should only be viewed as an estimate of potential GHG emissions impact, and actual emissions may vary significantly. Thus, when necessary, a conservative approach will be undertaken to ensure a robust assessment of possible emissions sources. All assumptions and limitations, including exclusions, will be documented as part of the assessment.
- An emission factor is a representative value that relates the quantity of a pollutant released into the atmosphere with an activity associated with the release of that pollutant. Emission factors are typically available from

government publications, independent agencies, and scientific research journals; however, the quality and accuracy of such factors can vary significantly. Factors can differ depending on the research body and/or underlying methodologies applied. Emission factors will therefore only be sourced from reputable sources, such as the Department for Energy Security and Net Zero (2023).

6.3.13 References

- BEIS (2022) Final UK greenhouse gas emissions national statistics: 1990 to 2020. Available at: https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-to-2020
- Department for Energy Security and Net Zero (2023), UK Government GHG Conversion Factors for Company Reporting
- East Riding of Yorkshire Council (2022) Climate Change Strategy Climate Change Strategy 2022-2030.pdf (eastriding.org.uk)
- IEMA (2022), Environmental Impact Assessment Guide to Assessing Greenhouse Gas Emissions and Evaluating their Significance
- PAS 2080:2023 (2023), Carbon management in buildings and infrastructure
- Royal Institute of Chartered Surveys (2023), Whole life carbon assessment for the built environment
- The Greenhouse Gas Protocol (2004) Corporate Accounting and Reporting Standard
- The Greenhouse Gas Protocol, A Corporate Accounting and Reporting Standard (Revised Edition) https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf
- UK Government (2022) Net Zero Strategy: Build Back Greener Net Zero Strategy: Build Back Greener – GOV.UK (www.gov.uk)
- UK Government (2023) Flood map for Planning https://flood-map-for-planning.service.gov.uk/

6.3.14 Scoping questions

- Do you agree with the receptors/matters that are proposed to be scoped in and out of further assessment?

6.4 Cultural heritage

6.4.1 Consultation

The Humber Historic Environment Record (HER) has been consulted in the preparation of this EIA Scoping Report for data on known heritage assets. East Riding of Yorkshire Council has also approved a Written Scheme of Investigation (WSI) for geophysical

survey of the Site, which began in September 2023 and is due to be completed by December 2023.

Historic England has been consulted regarding potential impacts on designated heritage assets as a result of changes in their setting; this consultation will be continued throughout the EIA.

Further consultation with East Riding of Yorkshire Council will be carried out to confirm the scope of and timing of any intrusive evaluation following completion of the geophysical survey, and the East Riding of Yorkshire Council's Conservation Officer will be consulted regarding potential impacts on Conservation Areas and Grade II Listed Buildings as these lie outside of the remit of Historic England.

6.4.2 Study area

Following the guidance from East Riding of Yorkshire Council, a 1 km study area from the Site boundary will be used for non-designated historic assets and a study area of up to 3 km from the Site boundary, informed by the Zone of Theoretical Visibility (ZTV), will be used for designated historic assets.

6.4.3 Data sources to inform the EIA baseline characterisation

The following sources of information have been used to inform this EIA Scoping Report:

- East Riding Local Plan (adopted April 2016), Policy ENV3: Valuing Our Heritage';
- Information on designated heritage assets from the National Heritage List for England, downloaded on 10 July 2023;
- Data on heritage assets and previous archaeological investigations from the Humber HER, obtained as a digital data extract on 13 July 2023;
- Historical Ordnance Survey (OS) mapping; and
- Lidar data.

The following additional sources will be used to inform the assessment:

- Aerial photographs held by Historic England Archives, Humber HER, and Cambridge University Collection of Aerial Photography;
- Maps and other relevant primary and secondary sources held in Hull History Centre and East Riding Archives; and
- Portable Antiquities Scheme (PAS) data.

6.4.4 Surveys to inform the EIA baseline characterisation

The following additional surveys are proposed to inform the EIA:

- Full desk-based assessment including walkover and 'aerial investigation and mapping' of Lidar data and aerial photographs. This will include an assessment of potential impacts on the setting of heritage assets in the Site and surrounding area, following the methodology in Historic England Good Practice Note 3.
- Geophysical survey (underway at the time of writing).

The need for, scope, and timing of any intrusive evaluation will be discussed and agreed with the statutory consultees following completion of the desk-based assessments and geophysical survey.

6.4.5 Baseline conditions

The Humber HER contains 61 records within the Site, of which five are findspots of artefacts. The records range from prehistoric features through to World War II structures, including a Romano-British occupation site and a Deserted Medieval Village, extant and demolished historic buildings and structures, cropmarks of enclosures and Medieval or post-medieval agricultural remains. Historic mapping records many lost field boundaries and irrigation drains, a number of bridges and several sand extraction pits within the Site, which have not previously been recorded in the HER. One designated asset is located within the Site boundary, a Grade II listed K8 telephone kiosk (NHLE 1482738).

Beyond the Site boundary, but within the 3 km study area, there are 17 Scheduled Monuments. Two of these, NHLE 1007843: the site of Meaux Cistercian Abbey and NHLE 1015305: Meaux duck decoy, border the Site boundary. The Scheduled Monuments are mainly Medieval in date – including castles, moated sites and ecclesiastical buildings – but there are also two Neolithic or Bronze Age barrows. There are also 12 Grade I, 37 Grade II*, and 440 Grade II Listed Buildings; one Grade II Registered Park and Garden; and 14 Conservation Areas within the 3 km study area. These include churches and funerary monuments, houses, public houses, farmhouses, agricultural buildings, street furniture and aqueducts.

There are 171 non-designated heritage assets within the 1 km study area which include findspots of artefacts, possible prehistoric ring ditches and barrows, abandoned Medieval and post-medieval settlements, extant and demolished historic buildings and structures (including windmills), archaeological remains including extraction pits, cropmarks of enclosures, Medieval or post-medieval agricultural remains, watercourses and trackways, and World War II military infrastructure.

6.4.6 Additional (secondary and tertiary) mitigation

Where archaeological remains within the Site do not require preservation in situ and cannot be avoided through primary mitigation (i.e. through changes to the Proposed Development layout and/or construction methods), it is anticipated that additional mitigation to off-set potential adverse impacts will take the form of a programme of archaeological investigation and recording secured by a DCO Requirement. Such a programme may include pre-commencement phases of archaeological excavation and/or archaeological ‘watching brief’ during construction. The need for and scope of such mitigation will be agreed with the East Riding of Yorkshire Council archaeological advisor and Historic England where necessary. The scope and methodology of the mitigation will be set out in a WSI.

No additional mitigation during the operational and decommissioning phase is currently proposed, as it is anticipated that any potential impacts would have been mitigated prior to or during the construction phase.

Where impact on the setting of heritage assets within the study area cannot be avoided through primary mitigation (i.e. through changes to the Proposed Development layout), it is anticipated that additional mitigation to offset any potential operational phase adverse impacts will be required. This would most likely involve planting and landscaping.

6.4.7 Description of likely significant effects

The layout of the Proposed Development is still being designed and surveys to establish the archaeological resources of the Site are ongoing. As such, there remains some uncertainty regarding both the direct physical impacts on heritage assets within the Site as a result of construction activities, and the extent of visual change within the setting of heritage assets in the wider study area. This has therefore resulted in assets being scoped into further assessment (see **Section 6.4.8** below) which may, following detailed design, be scoped out of further assessment as effects will have been avoided. Similarly, there are assets proposed to be scoped out of further assessment (see **Section 6.4.9** below) which may, following changes to design of the Proposed Development, be scoped back into further assessment should the asset then be affected.

The list of receptors outlined in **Section 6.4.8** below is therefore a "long list" of the heritage assets which will be considered in the assessment; however, not all are likely to experience significant effects. Assets that have been scoped out of further assessment at this stage (see **Section 6.4.9** below) are those where their particular characteristics and the contribution made by their setting to their significance are anticipated to be unaffected by the Proposed Development regardless of its final layout.

6.4.8 Receptors/matters to be scoped into further assessment

Receptor/Matter	Phase	Justification
Buildings and monuments recorded within the HER within the Site, except those scoped out below (refer to **Section 6.4.9**)	Construction and operation	Construction activity has the potential to directly impact on these assets and the operation of the Proposed Development may impact on the contribution that setting makes to their significance, with potential for significant effects to occur.
Seventeen Scheduled Monuments within 3 km of the Site	Operation	Depending on the layout of the Proposed Development, these assets may experience visual change in their setting during operation which could result in significant adverse effects.
Listed Buildings within 3 km of the Site, except those	Operation	Depending on the layout of the Proposed Development, these may experience visual

scoped out below (refer to **Section 6.4.9**)		change in their setting during operation which could result in significant adverse effects.
Conservation Areas within 1 km of the Site	Operation	Depending on the layout of the Proposed Development, these may experience visual change in their setting during operation which could result in significant adverse effects.
Currently unknown heritage assets within the Site	Construction and operation	There remains uncertainty about the extent and significance of heritage assets within the Site and therefore the potential for significant effects is unknown.

6.4.9 Receptors/matters to be scoped out of further assessment

Receptor/Matter	Phase	Justification
Meaux Abbey (NHLE 1007843) and Meaux duck decoy (NHLE 1015305) Scheduled Monuments	Construction	Meaux Abbey and Meaux duck decoy Scheduled Monuments border the Site. Construction activity which may directly impact upon archaeological remains associated with these assets will either be avoided through the establishment of suitable buffer zones (agreed with the relevant statutory consultees) or mitigated against through a programme of archaeological investigation and recording. Although historically likely to have been deliberately constructed within a tranquil area, Meaux Abbey is now part of an open modern rural agricultural landscape. To its east lies a modern vehicular road (Meaux Lane) and the working Meaux Abbey Farm borders its boundary to the west. These elements mean that the setting of the asset is already subject to some impact by noise and dust. Construction activity related noise and dust will be controlled through the Outline Construction Environmental Management Plan and are thought unlikely to be substantially more severe than the noise and dust impacts currently experienced by Meaux Abbey. Potential impacts from construction activity related noise and dust will also be temporary. No significant effects during construction are therefore predicted.

Grade II listed K8 telephone kiosk (NHLE 1482738)	Construction and operation	This asset lies within one of the possible cable routes of the Proposed Development. Construction activity which may directly impact upon this asset will be avoided through the establishment of a suitable buffer zone (agreed with the relevant statutory consultees) and appropriate physical protection from surrounding construction activities, such as Heras fencing. This physical protection will result in the public being unable to access the asset during the construction phase. However, this will be a temporary and fully reversible effect. No significant effects during construction are therefore predicted. The positive contribution made by setting to the significance of the telephone kiosk derives from its relationship with the settlement in which it sits, and this will not be altered by the Proposed Development during operation.
Setting effects on all heritage assets outwith the Site but within the 3 km study area, excluding Meaux Abbey (NHLE 1007843) and Meaux duck decoy (NHLE 1015305) Scheduled Monuments	Construction	Construction phase effects resulting from changes in the setting of heritage assets will be temporary and no worse than any setting effects during the operational phase. Construction activity related noise and dust will be controlled through the Outline Construction Environmental Management Plan and is unlikely to be significant. No assets have been identified that would be particularly sensitive to the temporary construction noise. Therefore, it is not considered necessary to repeat the setting assessment for the construction phase.
Heritage assets at greater than 50 m distance from centre line of cable route	Construction	Potential physical impacts as a result of the installation of the cable route will be limited to heritage assets which lie within or in the immediate vicinity of the proposed excavation works. The exact width of the cable excavation is yet to be determined, but is unlikely to be wider than 30 m. Therefore, non-designated heritage assets which lie at greater than 50 m distance on either side of the central line of the cable route are highly unlikely to be impacted. No significant effects are therefore predicted.
Findspots recorded by	Construction and operation	As findspots, these have been removed from the Site and the heritage significance of their

Humber HER within the Site		former locations will not be harmed by the Proposed Development.
Listed dwellings within the settlements of Beverley, Sutton, Cottingham, Brandesburton, Skirlaugh, Catwick, Burshill, Aike and Tickton	Operation	The positive contribution made by setting to the significance of residential Listed Buildings within settlements is typically confined to their immediate street scene and does not draw on views of the wider surroundings. No significant effects are therefore predicted.
Isolated Listed Buildings over 1 km from the Site (including Hull Bridge Mills (NHLE 1103423))	Operation	Apart from Hull Bridge Mills, all isolated Listed Buildings over 1 km from the Site are dwellings. The positive contribution made by setting to their significance is therefore typically confined to their immediate vicinity and does not draw on views of the wider surroundings. Likewise, the positive contribution made by setting to the significance of Hull Bridge Mills is confined to its immediate vicinity and does not draw on views of the wider surroundings. No significant effects are therefore predicted.
Conservation Areas over 1 km from the Site	Operation	The positive contribution made by setting to the significance of Conservation Areas is typically confined to their immediate street scene and does not draw on views of the wider surroundings. No significant effects are therefore predicted.
All heritage assets within the study area	Decommissioning	Decommissioning will not result in impacts to any additional heritage assets not affected during construction and operation. Decommissioning phase effects resulting from changes in the setting of heritage assets in the surrounding area will be no worse than the construction or operational phase effects. Decommissioning will reverse any adverse effects resulting from changes to the setting of heritage assets during operation.

6.4.10 Opportunities for enhancing the environment

Potential enhancement opportunities include the erection of information boards and installation of new footpaths close to the Scheduled Monuments of Meaux Abbey and

Meaux duck decoy, the replanting of lost hedgerow boundaries and the reinstatement or repair of historic walled boundaries within the Site. Where residual effects remain during operation, measures to enhance the significance of heritage assets not affected by the Proposed Development would provide additional beneficial effects to be counted in the planning balance.

6.4.11 Proposed assessment methodology

The Proposed Development would result in a change to the existing baseline, and change might be considered as impacts according to the degree of change in relation to heritage significance. In accordance with EIA Regulations, the assessment would identify potential impacts and effects as direct or indirect, adverse or beneficial, and short-term, long-term or permanent.

Direct impacts are those which physically alter an asset and therefore its heritage significance. Impacts upon setting are those which affect the heritage significance of an asset by causing visual or other sensory change within its setting. The assessment of effects resulting from change within the setting of heritage assets will follow the four-stage process set out in Historic England's Good Practice Advice Note 3: The Setting of Heritage Assets.

The assessment of effects will follow the significance criteria in **Appendix D**.

The residual effect is a product of the importance of the heritage asset and the magnitude of impact following mitigation. The importance of a heritage asset reflects any statutory or non-statutory designation or in the case of undesignated assets the professional judgement of the assessor with reference to regional research frameworks.

Conclusions of the assessed magnitude of impacts is a product of the consideration of the elements of an asset and its setting that contribute to its cultural significance and the degree to which the Proposed Development would change these contributing elements. The assessment will therefore reflect the varying degrees of sensitivity of different assets to change brought about by different types of development.

6.4.12 Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- Existing records for the historic environment do not record all heritage assets. This will be addressed through the desk-based assessment and aerial investigation and mapping survey to identify previously unrecorded assets and assess the potential for below ground archaeological remains. The geophysical survey will also further investigate the potential for below ground archaeological remains.

6.4.13 References

- East Riding Local Plan (adopted April 2016), Policy ENV3: Valuing Our Heritage.

- National Planning Policy Framework (2023). Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf
- Historic England (2017) Good Practice Advice in Planning Note 3: The Setting of Heritage Assets (Second Edition) Historic England: Swindon. Available online: https://historicengland.org.uk/images-books/publications/gpa3-setting-of-heritage-assets/heag180-gpa3-setting-heritage-assets/

6.4.14 Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of further assessment?
- Do you agree with the proposed factor-specific assessment approach

6.5 Land, soils and groundwater

6.5.1 Consultation

No consultation regarding land, soils and groundwater has been undertaken to date. The Environment Agency, the British Geological Survey (BGS) and East Riding of Yorkshire Council will be consulted as part of the assessment.

6.5.2 Study area

The Site plus a 250 m buffer has been considered with regard to identifying land, soil and groundwater related receptors that could be impacted by the construction, operation, and decommissioning of the Proposed Development. The size of the study area is considered appropriate to identify features that may be impacted by the Proposed Development and may impact the Proposed Development.

6.5.3 Data sources to inform the EIA baseline characterisation

The baseline conditions of the study area have been determined using a number of different sources, including:

- Geological maps (bedrock and superficial geology);
- Hydrogeological and groundwater vulnerability maps;
- Soil survey maps;
- Site-specific data from Envirocheck, including abstraction and discharge records relating to groundwater, aquifer designations, source protection zones; and Environment Agency, local authority and BGS data on the location of waste sites, pollution incidents and potentially contaminated sites;
- Mineral sterilisation and geological conservation review sites; and
- Publicly available historical mapping for the Site.

Other information has been obtained from the BGS Onshore GeoIndex, SoilScapes mapping, Defra's MAGIC maps and publicly available local authority information (see **Section 0**).

A Preliminary Risk Assessment (PRA) report will be prepared in support of the DCO application to provide a desk-based analysis of the Site.

6.5.4 Surveys to inform the EIA baseline characterisation

A walkover survey of the Site and surrounding area will be undertaken as part of the baseline assessment relating to land and soils.

An Agricultural Land Classification survey of the Site will be undertaken.

6.5.5 Baseline conditions

Designated geological sites

There are no recorded geological conservation review sites or regionally important geological and geomorphological site (RIGS) within or close to the Site.

Mineral extraction sites and mineral safeguarding areas

There are no operational mineral extraction sites within the Site boundary. There is evidence of historical quarrying or mineral extraction, with four sites reported within the Site boundary (all relating to the extraction of sand deposits), and ten others shown within 250 m of the Site (either sand or sand and gravel extraction sites).

There are several mineral safeguarding areas across the Site, which relate to deposits of sand and gravel, as identified on BGS geological mapping.

Geology

The bedrock geology across the Site is composed of the Flamborough Chalk Formation, which consists of white, well-bedded, flint-free chalk with common marl seams.

The superficial geological units across the Site include alluvium, till, sand and gravel, and tidal flat deposits.

Made ground is potentially present in localised areas associated with mineral extraction sites, farm buildings or tracks, but there is no indication that extensive areas of artificial ground would be present. There are no mapped areas of artificial ground shown on the BGS map database.

An initial review of BGS borehole records was undertaken, and these were in agreement with the recorded geological succession. Depths to the chalk bedrock were variable, typically with shallower bedrock further north (around 3 m below ground level (bgl)) and deeper towards the south (around 14 m bgl).

Soil

Agricultural Land Classification mapping indicates that the majority of the Site is classified as Grade 3 (good to moderate) agricultural land.

Hydrogeology

The bedrock deposits underlying the Site form a principal aquifer, with superficial geological units defined as secondary A aquifers or secondary aquifers (undifferentiated).

Principal aquifers are defined as strategically important rock units that have high permeability and water storage capacity.

A secondary A aquifer is defined as permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers.

Depth to groundwater is unconfirmed. It is anticipated that the regional direction of groundwater flow is in line with local topography and towards surface watercourses.

A large zone I Source Protection Zone with respect to a groundwater abstraction source is present close to Cottingham, with large sections of the Site being within the zone I (inner protection zone), zone II (outer protection zone) and zone III (total catchment) sections of the Source Protection Zone. There is also a small zone I abstraction located close to Monkbridge Plantations to the east of the Site. The total catchment zone for this abstraction point extends across some areas of the Site.

The environmental database search did not identify any other groundwater abstractions within the Site.

Discharge consents

There are nine discharge consents within the Site boundary, two of which are trade discharges and seven are sewage discharges. There are 27 off-site discharge consents within 250 m of the Site, which are also related to trade and sewage discharges.

Historical site usage

Since earliest publicly available historical mapping (1850s), the Site has undergone little significant change. The watercourses and main drains were all already present at that time, with numerous field boundaries and plantations that remain on-site. The area is predominantly agricultural in nature from those map editions, with many of the farms and villages also shown. The main exception to this is the residential area of Cottingham, which has gradually developed and extended around the original village over the last century.

Landfill sites and waste transfer sites

No licensed active waste management facilities or landfill sites are recorded within the Site. There are three historical landfill sites within the Site, two of which accepted inert and industrial waste, with no records on the waste type accepted by the third site. There are three off-site landfill sites within 250 m of the Site, two of which are listed as ‘historical landfill sites’ in the environmental database information, and the third is listed as ‘other waste management licence’, and is indicated to be inactive.

Land contamination

The Site history indicates that land use has been agricultural. Contamination may be present associated with agriculture, but based on publicly available historical mapping, there is no information suggesting other potential contaminative site uses have occurred. Made ground may be present in limited locations within mineral extraction sites, along tracks and close to farm buildings located within the Site. There is the potential for asbestos-containing materials to be present if made ground deposits are identified.

No significant pollutions incidents within or close to the Site have been recorded in the last 20 years.

Natural geological hazards

According to the environmental database information, there is the potential for low to moderate risks from geological hazards within some sections of the Site, as follows:

- Collapsible ground hazards: no hazard or very low hazard;
- Compressible ground hazards: some areas at moderate risk from hazard;
- Running sand hazards: most of the Site is low to very low risk, with a small area of moderate risk towards Kingswood;
- Shrink/swell hazards: low to very low hazard;
- Ground dissolution hazards: most of the Site is not at risk, with small areas of very low hazard; and
- Landslide hazards: very low hazard.

6.5.6 Additional (secondary and tertiary) mitigation

Construction

The following measures will be incorporated into the Outline Construction Environmental Management Plan and Outline Soil Management Plan, to ensure that damage to land, soils, and groundwater can be minimised during the construction phase (note that these are examples, and not a full list of measures):

- Soil management during works will incorporate guidelines for soil handling, to include replacement of soil in temporary laydown areas;
- During construction works, surface water drains should be designed to carry only uncontaminated water. Foul drains should carry contaminated water to a sewage treatment works under suitable discharge consent; and
- Concrete mixing would be undertaken in designated areas to minimise the potential for impact on watercourses.

Standard mitigation to be applied will be protective of all groundwater resources so that there are no negative effects on the groundwater.

Operation and decommissioning

No additional mitigation measures would be expected to be required during operational or decommissioning phases beyond the embedded mitigation incorporated into the design of the Proposed Development and the measures detailed in the Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan.

6.5.7 Description of likely significant effects

There may be contamination issues, due to the recorded presence of historical landfills sites within the Site boundary.

Due to the nature of the Proposed Development, soils will be impacted to a degree during construction works. Based on Agricultural Land Classification mapping, the majority of the Site is classified as Grade 3 (good to moderate) agricultural land.

6.5.8 Receptors/matters to be scoped into further assessment

Receptor/Matter	Phase	Justification
Land (potential contamination)	Construction	Historical landfill sites have been identified within the Site. Further assessment of these features will be completed as part of the Preliminary Risk Assessment report.
Land (soils and agricultural land)	Construction, operation and decommissioning	Soils are a key resource in the area of the Proposed Development, and require appropriate handling in order to prevent physical damage to the resource. There is also the potential for the Proposed Development to impact this resource by restricting access to the soils for agricultural usage. Information on the ALC of soils is important when assessing the significance of effects on this resource. Based on Agricultural Land Classification mapping, the majority of the Site is classified as Grade 3 (good to moderate) agricultural land.

6.5.9 Receptors/matters to be scoped out of further assessment

Receptor/Matter	Phase	Justification
Land (geological units)	Construction, operation and decommissioning	There are no sensitive geological units identified within the study area. Geology comprises bedrock units of chalk with superficial units including alluvium, till, sand and gravel, and tidal flat deposits.
Land (geological conservation review sites)	Construction, operation and decommissioning	There are no geological sites of scientific interest within the Site or within 250 m of the Site.
Land (mineral safeguarding)	Construction, operation and decommissioning	There are a small number of historical mineral extraction sites within the Site boundary, as well as a number of mineral safeguarding areas. As a result, it is proposed that an

		assessment of mineral safeguarding issues will be undertaken in support of the DCO application and presented in the Planning Statement, outwith the EIA. This will include consultation with the Mineral Planning Authority (East Riding of Yorkshire Council and Hull City Council).
Land (geological hazards)	Construction, operation and decommissioning	The baseline review has not identified any geological hazards that require specific consideration during construction, operation or decommissioning of the Proposed Development.
Land (potential contamination)	Operation and decommissioning	Potential contamination associated with the historical landfills will be addressed during the construction phase as part of intrusive site investigation work (see **Section 0** above). There would not be anticipated to be any further impacts on the Proposed Development during operation or decommissioning as a result of existing contamination. Any issues relating to contamination resulting from project activities would be controlled by the requirements of the Outline Operational Environmental Management Plan and the Outline Decommissioning Environmental Management Plan (e.g., issues relating to storage and use of fuels). These documents would also address the potential for the Proposed Development to affect existing contamination.
Groundwater	Construction, operation and decommissioning	The groundwater in bedrock deposits is a principal aquifer, and in superficial geological units it is either a secondary A aquifer or secondary aquifer (undifferentiated). Source Protection Zones are present across the Site associated with abstraction boreholes near Cottingham and Monkbridge Plantation. The quality of groundwater will be appropriately protected by mitigation measures implemented via the Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan, to be submitted in support

		of, and secured by, the DCO application. They will be managed by the principal contractor undertaking the works. The purpose of the Outline Construction Environmental Management Plan, Outline Operational Environmental Management Plan and Outline Decommissioning Environmental Management Plan is to provide guidelines to avoid, minimise or mitigate effects on the environment (including issues relating to groundwater) during construction, operation and decommissioning. This would include emergency procedures to manage accidental spillages and leaks and include procedures to mitigate against contaminated land and erosion. Due to the connection between quality of surface water and quality of groundwater, the Surface Water Management Plan will also be important in avoiding, minimising and mitigating effects on groundwater. The Surface Water Management Plan will include best practice working methods for the protection of surface water from pollution and other adverse impacts, which could have subsequent effects on groundwater. The management plans will include items such as: • Pollution incident control; • Emergency preparedness; • Extreme weather events; • Construction site security; and • Site materials and waste management. If necessary, a piling risk assessment will be a requirement at a later stage in the project, prior to construction commencing. This will ensure potential risks to groundwater from piling operations are managed appropriately (information to be collected during the site investigation will be required to feed into this risk assessment). It is possible that changes to the surface water regime could have a negative impact on the Site groundwater. However, adhering to industry best practice with respect to

		protection of surface water will ensure that any adverse effects to surface water are minimised, reducing the potential for corresponding changes within the groundwater.

6.5.10 Opportunities for enhancing the environment

No opportunities for environmental enhancement have been identified in respect of land, soils and groundwater at this stage.

6.5.11 Proposed assessment methodology

The following documents are relevant to the preparation of the land, soils and groundwater assessment:

- Part IIA, Environmental Protection Act 1990 (relevant in terms of assessment of contaminated land)
- The Environmental Permitting Regulations (England & Wales) 2016 (last revised March 2020) (relevant with respect to environmental permits)
- National Planning Policy Framework September 2023
- Draft Overarching National Policy Statement for Energy (NPS EN-1) (March 2023) incorporates principles relating to geological conservation, land use and resource and waste management
- Land Contamination Risk Management, July 2023
- A new perspective on Land and Soil in Environmental Impact Assessment, IEMA, February 2022
- Construction Industry Research and Information Association (CIRIA) report Contaminated Land Risk Assessment (A guide to good practice) C552, 2001
- Natural England Technical Information Note TIN049: Agricultural Land Classification: protecting the best and most versatile land, 2nd edition (2012)
- East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan, 2016 to 2033, adopted November 2019.

A desk-based Preliminary Risk Assessment report will be prepared in support of the DCO application, which assesses the potential risks on the existing land, soil and groundwater baseline, including contamination issues. The Preliminary Risk Assessment report conclusions and results of ground investigations will determine necessary mitigation measures to ensure that the construction, operation and decommissioning of the Proposed Development do not result in significant effects on the receiving land, soil and groundwater environment.

The assessment of baseline data will include a review of the information obtained for the Site for the matters that are to be scoped in, and each will be considered using professional judgement to determine whether the level of available information is acceptable.

The significance of potential effects is assigned based on a set of definitions, as provided in **Appendix D**, and professional judgement will be used as appropriate to assess potential risks.

6.5.12 Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- Data on-site history have been obtained from publicly available historical maps, and there may be developments that occurred between map editions that are not evident.
- No intrusive site survey data or Agricultural Land Classification survey data were available to inform this EIA Scoping Report, but these will be made available as the works associated with the Proposed Development progress.

6.5.13 References

- A new perspective on Land and Soil in Environmental Impact Assessment, IEMA, February 2022. Available online: https://www.iema.net/resources/blog/2022/02/17/launch-of-new-eia-guidance-on-land-and-soils
- Defra mapping https://magic.defra.gov.uk/MagicMap.aspx
- East Riding of Yorkshire and Kingston upon Hull Joint Minerals Local Plan, 2016 to 2033, adopted November 2019. Available online: https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/joint-minerals-plan/
- Environmental Protection Act 1990, Part IIA. Available online: https://www.legislation.gov.uk/ukpga/1990/43/part/IIA.
- Land Contamination Risk Management 2023. Available online: https://www.gov.uk/government/publications/land-contamination-risk-management-lcrm
- National Planning Policy Framework (2023). Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf
- Draft Overarching National Policy Statement for Energy (EN-1) 2023. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1147380/NPS_EN-1.pdf
- Site-specific environmental database information (6 October 2023, reference SR00275328_318257239), reviewed in geographical information systems (GIS) format
- SoilScapes (2023) https://www.landis.org.uk/soilscapes/.
- The Environmental Permitting (England and Wales) Regulations 2016 (last revised March 2020). Available online: https://www.legislation.gov.uk/uksi/2016/1154/made

6.5.14 Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Are any receptors or resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of further assessment?

6.6 Landscape and visual

6.6.1 Consultation

Consultation in relation to landscape and visual matters commences with production and submission of this EIA Scoping Report. No prior consultation to inform the Landscape and Visual Impact Assessment (LVIA) has been undertaken to date.

Following submission of the EIA Scoping Report, discussions will be held with Natural England and East Riding of Yorkshire Council to agree the finer detail of the LVIA. Agreement will be sought on a selection of assessment viewpoints to be used in the LVIA, including the illustrative techniques to be used for any visualisations of the Proposed Development.

6.6.2 Study area

Best practice guidance for the assessment of landscape and visual effects (Guidelines for Landscape and Visual Impact Assessment – GLVIA 3) states:

"Scoping should … identify the area of landscape that needs to be covered in assessing landscape effects. This should be agreed with the competent authority, but it should also be recognised that it may change as the work progresses, for example as a result of fieldwork, or changes to the proposal. The study area should include the site itself and the full extent of the wider landscape around it which the proposed development may influence in a significant manner."

And:

"Scoping should identify the area that needs to be covered in assessing visual effect, the range of people who may be affected by these effects and the related viewpoints in the study area that will need to be examined. The study area should be agreed with the competent authority at the outset and should consider the area from which the proposed development will potentially be visible. The emphasis must be on a reasonable approach which is proportional to the scale and nature of the proposed development."

To assist in the determination of an appropriate and proportionate study area for the LVIA, a series of preliminary ZTV plans have been prepared and these are presented in **Appendix G Figures 3a-3f and Figure 4**. The ZTVs illustrate the 'worst case scenario' of visibility for various elements of the Proposed Development, based on the anticipated parameters set out in **Chapter 2: Description of the Proposed Development**. The purpose of the ZTVs at this stage is simply to identify the maximum possible extents of visibility and to help identify potential visual receptors.

It should be noted that the ZTVs presented in **Appendix G Figures 3a-3f and Figure 4** take account of the screening effect of significant blocks of woodland and also buildings, but do not take account of walls, hedgerows, tree lines, or smaller tree groups. As is typical for all such ZTVs, the visibility shown on the plans is exaggerated and the actual extent of visibility of any development on the Site would be considerably more constrained than is indicated on these preliminary ZTVs.

The following ZTVs have been produced (**Appendix G**):

- **Figure 3a** ZTV of the maximum extents of the solar PV modules at 3.5 m in Land Area A (Fields A3-A11).
- **Figure 3b** ZTV of the maximum extents of the solar PV modules at 3.5 m in Land Area B (Fields B1, B3-B4, B7-B8) and Land Area C (Fields C1-C8).
- **Figure 3c** ZTV of the maximum extents of the solar PV modules at 3.5 m in Land Area B (Fields B5-B6).
- **Figure 3d** ZTV of the maximum extents of the solar PV modules at 3.5 m in Land Area D (Fields D1-D17) and Land Area E (Fields E1-E5 and E8-E12).
- **Figure 3e** ZTV of the maximum extents of the solar PV modules at 3.5 m in Land Area E (Fields E13-E17).
- **Figure 3f** ZTV of the maximum extents of the solar PV modules at 3.5 m in Land Area F (Fields F1-F16).
- **Figure 4** ZTV of potential substation locations at 15 m in Land Areas B, C and D.

The ZTVs presented in **Appendix G Figures 3a-3f** treat the six separate visibility target areas as standalone developments but should be read together to understand the full extent of visibility. In each case, the ZTVs for the 3.5 m solar PV modules (**Appendix G Figures 3a-3f**) assume that the entire extent of the potential zone for solar shown is filled with solar PV modules.

In the ZTV for the two on-site substations (**Appendix G Figure 4**), the ZTV assumes that the full extent of Land Areas B, C and D could have structures up to 15 m (communications tower only, electrical equipment will have a maximum height of 8 m) anywhere within those Land Areas. In reality, the two on-site substations would occupy a fraction of the Land Area modelled and therefore visibility would be considerably less than implied by these ZTVs.

Based on analysis of the ZTVs (**Appendix G Figures 3a-3f and Figure 4**), field work undertaken to date and past experience of similar projects, it is considered unlikely that there would be anything other than negligible, distant and filtered glimpses of the solar PV modules or two on-site substations beyond 3 km of the fields in which they are located and at such distances, the effects would in no circumstances be significant. In most directions, visibility would in reality be restricted to much closer than this. It is therefore proposed that a 3 km study area offset from the boundaries of the fields in which solar

PV modules and the two on-site substations may be located is more than adequate and proportionate for the consideration of landscape and visual effects arising as a result of the operation of the Proposed Development.

With respect to the underground cable connection to the National Grid substation at Creyke Beck, it is unlikely that this would give rise to any operational phase landscape and visual effects as it would not be visible, but it is recognised that there could in theory be construction/decommissioning effects associated with laying the cable.

It is therefore proposed that the detailed study area and the main focus of the LVIA will be within 3 km of the fields within which solar PV modules and the two on-site substations may be located; but that it will also include land up to 100 m either side of the underground cable route where it extends to the south-west of the Land Areas. The study area is considered adequate to identify all non-negligible effects on landscape and visual receptors. The proposed study area is presented on **Appendix G Figure 1**.

6.6.3 Data sources to inform the EIA baseline characterisation

The LVIA will draw upon information in the following published landscape character assessments:

- National Character Area (NCA) Profile 40 – Holderness (Natural England, 2015); and
- East Riding of Yorkshire Landscape Character Assessment (AECOM, 2018).

The LVIA will consider relevant policy and guidance contained within:

- East Riding Local Plan (adopted, April 2016); and
- Draft East Riding Design Code (September 2023) and any subsequently adopted documents.

6.6.4 Surveys to inform the EIA baseline characterisation

Several visits to the Site and the surrounding landscape have already been undertaken, including walking PRoW and establishing the closest residential receptors and potential views into the Site.

Further site visits will be undertaken in winter 2023/2024 and again in summer 2024 to photograph the baseline views from a range of locations (viewpoints) within and surrounding the Site to represent a range of views and visual receptors of the Site. The location of the viewpoints will be agreed through further consultation with statutory consultees (East Riding of Yorkshire Council and Natural England).

Where access to private property can be arranged, visits will also be made to selected residential properties, based on the initial study area surveys and appraisals and in consultation with East Riding of Yorkshire Council, to assess the potential for visual effects on residential amenity.

6.6.5 Baseline conditions

Landscape designations

No part of the Site or its immediately surrounding context falls within a statutorily designated landscape. The nearest Areas of Outstanding Natural Beauty (AONB) to the Site are the Lincolnshire Wolds AONB and Howardian Hills AONB, both of which are over 30 km from the Site and would not be affected by any development within the Site. Natural England is currently undertaking a study known as the Yorkshire Wolds Designation Project within which a provisional candidate area to be designated as an AONB is being considered. There is not a set boundary for this project; the eastern extents of the area under consideration extend to approximately 7 km west of the Site, but at this distance the candidate area would not be affected by any development within the Site.

There are no Registered Parks and Gardens within 3 km of the Site; the nearest are located 6.3 km (Thwaite Hall) and 6.5 km (Risby Hall) south-west of the south-western corner of the Site and 6.7 km south-east (Burton Constable) of the south-eastern corner of the Site boundary. There would be no visibility of the Proposed Development at this distance.

There are also no local landscape designations covering any part of the 3 km study area. The locally designated Yorkshire Wolds Important Landscape Area is just over 5 km west of the western extents of the Site (though approximately 2.2 km west of the extents for the cable route options).

Landscape character

The Site and proposed study area is located in the centre of National Character Area (NCA) 40 Holderness. The Natural England profile describes NCA40 Holderness as:

"…*a rural, low-lying, undulating plain with the broad, shallow valley of the River Hull flowing southwards through the centre towards Hull"*

"An extensive network of rivers, ditches, becks, dykes and canals drains the River Hull. The high-quality agricultural land comprises large field patterns bounded by drainage ditches on the River Hull flood plain,"

"Long views over the flat landscape and the relatively dispersed nature of settlement instil a sense of tranquillity, which is reinforced by sparse woodland cover."

At a district level, the East Riding of Yorkshire Landscape Character Assessment (ERYLCA) identifies Landscape Character Types (LCTs) and Landscape Character Areas (LCAs). These are illustrated in **Appendix G Figure 2**. In total, 23 LCTs have been identified, which were further subdivided into 82 LCAs.

The majority of the Site, as well as the bulk of the study area, excluding the northern most Land Area (Land Area A) and cable route options to the south, is located within LCT 19: Open Farmland and in LCA 19D: Central Holderness Open Farmland. The LCA is described in the ERYLCA as being *"a large-scale landscape with a gently undulating landform. Panoramic views to the east coast and the neighbouring Wolds are available from this LCA."* Its key characteristics, which are relevant to the study area, are listed as:

- *"Gently undulating topography, hummocky in places.*
- *Very open landscape with few trees overall.*
- *Irregular field pattern of pre parliamentary enclosure.*

- *Dispersed villages linked by winding roads.*
- *Red brick buildings with pantile roofs sometimes painted white.*
- *Churches are often prominent features on the skyline.*
- *Irregular drainage pattern overall.*
- *Hedgerow field boundaries with few trees.*
- *Intensive farmed arable landscape.*
- *Large number of wide developments visible across the landscape both within LCT 19 and adjoining LCTs."*

The northern Land Area (Land Area A) is mostly located within LCA 18A: River Hull Corridor; the very eastern edge of the fields are within LCA 18B: Quarry Farmland (but typically exhibit characteristics of LCA 18A). LCA 18A is a narrow corridor around the river and the East Riding of Yorkshire Landscape Character Assessment states, *"The recreational value of the area is the result of the navigation of the river, Public Rights of Way along the river banks, nature reserves with public access and the provision of facilities such as car parking and picnic sites. The River Hull corridor is a tranquil and attractive area that attracts visitors…"* Its 'positive landscape features', as described in the East Riding of Yorkshire Landscape Character Assessment (as opposed to 'key characteristics'), which are relevant to the study area, are listed as:

- *"Flat low lying landscape*
- *Pockets of woodland cover dispersed along the corridor*
- *Ditches form many field boundaries with hedges concentrated on the marginally higher drier ground*
- *Largely rectilinear field pattern indicating parliamentary enclosure with pockets of early enclosure linked to settlement*
- *Linear drainage ditches such as Beverley Barmston Drain.*
- *Wet grassland and marsh habitats including Pulfin Bog and Tophill Low SSSI's.*
- *Low density of development/settlement with relatively tranquil character.*
- *Overall good scenic quality."*

The other LCAs within the proposed study area are:

- 18B: Quarry Farmland (northern end of the study area)
- 16E: Lund Sloping Farmland (north-west of study area, to the west of the River Hull)
- 18F: Figham and Swine Moor Common (west of study area on the eastern periphery of Beverley, potentially host to the underground cable corridor)
- 16F: Beverley Parks Farmland (in south-west corner of the study area, but potentially host to the underground cable corridor)
- 17B: North Cottingham Farmland (in south-west corner of the study area, but potentially host to the underground cable corridor)
- 18C: Catfoss Dyke (a small section at very north-eastern corner of the study area)
- 17A: Headon, Preston and Bilton Farmland (a small section at very south-eastern corner of the study area)
- 19A: Rise Parkland (a small section within the eastern boundary of the study area)

- 19C: North Holderness: Open Farmland (a small section at very north-eastern corner of the study area)

Visual receptors

Visual receptors are *"the different groups of people who may experience views of the development"* (GLVIA, 3rd edition, para 6.3). In order to identify those groups who may be significantly affected by the Proposed Development, an initial review of the ZTVs, baseline studies and preliminary site visits have been undertaken. When preparing the LVIA, this work will be expanded on and considered in more detail.

The different types of groups assessed will encompass local residents; people using key routes such as roads; cycle ways, people within accessible or recreational landscapes; people using PRoW; or people visiting key viewpoints.

The relatively flat landscape means that there can often be long-distance views around the study area; but also that fairly low-level planting, such as hedgerows, can provide significant screening for low-level developments.

Settlements

Beverley is located on the western boundary of the 3 km study area, with the section of town east of the railway line inside the study area. Due to intervening built form, the Proposed Development would not be visible from the settlement, with the possible exception of those properties on the very eastern edge of the town (adjacent to the A164). However, even for properties on the eastern edge of Beverley, potential views would be screened by the retail and business park located on Grovehill Road and the embankment around the River Hull.

Small settlements in the study area are listed below; all distances given are at the closest point to the Land Areas:

- The villages of Leven (1.1 km north of Field B1) and Catwick (1.8 km north-east of Field B5) are located in the landscape to the north-east of the proposed Land Area B for solar PV modules and to the east-south-east (2.1 km and 4.8 km respectively) of Land Area A. The settlements are outside the ZTVs for the solar arrays, but any on-site substation infrastructure may be visible.
- The villages of Hull Bridge (2.2 km north-west of Field E13), Tickton (1.2 km north-west of Field E1) and Routh (900 m north of Field D6) are located on the A1075, which is orientated west to east, in between Land Area A and Land Areas D and E.
- The village of Long Riston is within the east of the study area (1.4 km east of Field B8 and 300 m south-east of Field B6), east of the A165.
- The village of Weel is located in the west of the study area on the eastern side of the River Hull (300 m west of Field E14).
- The village of Skirlaugh is on the A165, within the south-east of the study area (2.4 km east-south-east of Field C9).
- The villages of Woodmansey (1.7 km south-west of Field E16) and Thearne (1.9 km west-south-west of Field F15) are both in the south-west corner of the study area and west of the River Hull. The villages are outside the ZTVs for the solar arrays.
- The village of Wawne is in the south of the study area (730 m south-west of Field F17).

- Kingswood forms the northern most part of Hull, and is located on the southern boundary of the study area (1.7 km south of Field F17), outside the ZTV for solar arrays.

For all the above settlements, there would be limited views into the Site due to the flat local topography and low-level nature of the Proposed Development. However, depending on the final design and layout of the Proposed Development, there is the theoretical potential for there to be views of the Proposed Development from the fringes of these settlements, but there is also potential through design and mitigation to minimise the view of new infrastructure.

In addition to the settlements above, there are scattered properties throughout the 3 km study area, including some in relatively close proximity to the proposed area for solar PV modules, including:

- Houseboats on the River Hull, (closest field) Field A3;
- High Baswick and Baswick Steer Cottages, Field A4;
- Linley Bungalow, Field A5;
- Low Baswick, Field A6;
- Carr House Farm, Field B7/B8;
- White Cross Cottage, Field B1;
- Prospect Cottage, Field B5;
- East House/Stall Smokehouse, Field B5/B3;
- Arnold Carr Farm, Field C6/C9;
- Meaux Abbey Farm (and neighbouring properties), Field D17;
- Woodhouse and The Cottage, Field E14/D8;
- Stud Farm (and neighbouring property), Field D17;
- Crown Farm, Field E12;
- Abbey Cottage, Field F1;
- Bridge Cottage, Field F6;
- Wawne Grange, Field F10;
- Oriana Lodge, Field F16;
- The Bungalow, Field F16;
- Meaux Stables, Field F17;
- Carr House Farm, Field E13;
- The Homestead, Field E14; and
- Springdale Farm, Field E16.

Key routes

The key routes within the 3 km study area are the:

- A1305, running broadly east to west through the centre of the study area from Beverley to Brandesburton;
- A165, running north to south through the south-east of the study area from Leven to Skirlaugh;

- A164 Beverley ring road within the west of the study area; and
- Hull Road, running north to south in the south-west of the study area from Beverley to Hull.

Recreational routes

Recreational users of PRoW would likely be the most sensitive visual receptors of any change in the landscape.

There are no national or regional trails within the 3 km study area.

National Cycle Network (NCN) Route No. 164 is located on, or roads adjacent to, the A1305, from Beverley to Leven.

A review of the East Riding of Yorkshire Council Definitive Map shows that there are several PRoW within the 3 km study area, including along the boundary of some of the field parcels. Those closest to the Site, and most likely to be impacted, are:

- Leven footpath no. 6 (Commences at the western end of Leven Canal and leads in a northerly direction along the east bank of the River Hull to the Brandesburton parish boundary at Baswick Steer). Adjacent or close to FieldsA1, A2 and A4.
- Riston footpath no. 2 (Commences at Meaux and Benningholme Road Bridge on Kid Hill Lane and leads in a northerly direction along the East Bank of Drewery's Sock Dyke and Monk Drain to the Leven parish boundary.). Adjacent to the Site for 4.6 km and occasionally between field parcels. Adjacent or close to Fields B1, B2, B3, B4, B7, B8, C1, C2, C3, C4, C5, C7 and C8.
- Riston footpath no. 1 (Commences at the west end of Woodhouse Lane, Arnold, and leads in a north-westerly direction to Arnold Carr Farm then westwards to Drewery's Large Bridge and on to Carr House. It then leads south-easterly along the Wawne parish boundary to Bulldike). Adjacent to the Site for 1.6 km and occasionally between field parcels. Adjacent or close to Fields C4, C5, C6, C7, C8 and C9.
- Tickton Bridleway no. 5 (Commences at the south end of Carr Lane and leads in an easterly then southerly direction to the Wawne parish boundary at Park Hill where it joins footpath No. 9). Adjacent or close to FieldsE13, E14 and E17.
- Wawne footpath no. 1 (Commences on Cooper's Lane (Meaux Road) approximately 150 m west of Foxholme and leads in a north-easterly direction to Cooper's Lane at East Field). Adjacent or close to FieldsF16 and F17.

Other recreational and/or tourist receptors

Other receptors to be considered within the LVIA include receptors at:

- The River Hull;
- Tophill Low Nature Reserve;
- Hainsworth Park Golf Club;
- Holiday parks at Brandesburton;
- High Farm Holiday Park and Heron Lakes; and
- Let Loose Adventure Park.

6.6.6 Additional (secondary and tertiary) mitigation

Construction

Consideration will be given to the site selection for compounds and equipment laydown areas to minimise landscape and visual effects as far as practicable. There is, however, limited potential for additional mitigation of short-term landscape and visual construction effects of the Proposed Development.

Lighting of any construction compounds will be designed to minimise visual intrusion.

Existing trees, woodlands and hedgerows would be protected in accordance with best practice for construction in proximity to trees and in accordance with relevant British Standards.

Operation

A high-quality design will be secured, firstly through careful site selection for the various components of the Proposed Development, taking account of the potential landscape and visual effects. Removal or disruption to any existing landscape fabric (e.g. trees, hedgerows) will be minimised to that which is absolutely necessary for the implementation of the Proposed Development.

An Outline Landscape and Ecological Management Plan will be developed in accordance with the principles of good design to integrate the Proposed Development into the landscape and mitigate visual effects as far as practicable. The Outline Landscape and Ecological Management Plan will be complementary to any biodiversity and other environmental objectives. The landscape design will seek to deliver landscape enhancements over and above the requirement to simply mitigate adverse effects.

The Outline Landscape and Ecological Management Plan will seek to manage and restore existing vegetation and habitats within the Site, as well as implement the planting of extensive areas of new native vegetation and creation of new biodiverse habitats.

The Outline Landscape and Ecological Management Plan will be developed in consultation with East Riding of Yorkshire Council and Natural England to secure the long-term management of the landscape and biodiversity strategy.

Decommissioning

This stage of the Proposed Development will be similar to the construction stage, albeit in reverse whereby the dismantled equipment will need storing within the Site prior to removal. Given the anticipated operational duration (40 years), mitigation landscaping will have reached maturity and short-term landscape and visual effects during decommissioning will be more filtered and/or screened than at the construction stage. No additional mitigation is envisaged during this phase.

6.6.7 Description of likely significant effects

At this stage, prior to any formal assessment and in the absence of fixed development proposals, it is acknowledged that there is the potential for significant landscape and visual effects to arise during construction, operation and decommissioning of the Proposed Development.

The LVIA will therefore consider the potential effects upon:

- Landscape fabric;

- Landscape character; and
- Visual receptors including residential, transport and recreational receptors.

Whilst the ZTVs presented in **Appendix G Figures 3a-3f** and **Figure 4** illustrate theoretical visibility out to 3 km (for the solar arrays), it is likely that any significant effects would only extend across a much narrower radius from the Site boundary than this.

Based on site analysis to date and previous experience of assessing the significance of landscape and visual effects for solar farms in similar landscapes, it is considered likely that any significant landscape and visual effects arising from the Proposed Development would be limited to within a distance of approximately 3 km.

6.6.8 Receptors/matters to be scoped into further assessment

Receptor/Matter	Phase	Justification
East Riding LCA 19D: Central Holderness: Open Farmland	Construction, operation and decommissioning	The bulk of the Site and study area falls within this LCA and there would be a large scale of change in localised parts of this LCA.
East Riding LCA 18A: River Hull Corridor	Construction, operation and decommissioning	The northern parcel of land (Fields A1-A11) falls within this LCA and there may be a large scale of change in a localised part of this LCA.
East Riding LCA 18F: Figham and Swine Moor Common	Construction, operation and decommissioning	This LCA is potentially host to the underground cable corridor to the south-west of the Site. If the final route of the underground cable avoids the LCA, then this LCA will be scoped out of further assessment. There is potential for localised effects arising from the loss of landscape elements.
East Riding LCA 16F: Beverley Parks Farmland	Construction, operation and decommissioning	This LCA is potentially host to the underground cable corridor to the south-west of the Site. If the final route of the underground cable avoids the LCA, then this LCA will be scoped out of further assessment. There is potential for localised effects arising from the loss of landscape elements.
East Riding LCA 17B: North Cottingham Farmland	Construction, operation and decommissioning	This LCA is potentially host to the underground cable corridor to the south-west of the Site. If the final route of the underground cable avoids the LCA, then this LCA will be scoped out of further assessment. There is potential for localised effects arising from the loss of landscape elements.

Visual receptors in the vicinity of Burshill	Construction, operation and decommissioning	Potential views from receptors in the landscape to the east of the River Hull within the north-east of the study area, including Brandesburton, Hainsworth Park Golf Club and adjacent holiday parks; for local residents and visitors to the area.
Visual receptors in the vicinity of Leven	Construction, operation and decommissioning	Potential views from receptors in and around the settlement of Leven, including Catwick; for local residents and visitors to the area. Views of solar arrays are considered unlikely, but there is considered to be potential visual impacts from taller on-site substation infrastructure. However, these receptors could potentially be scoped out of further assessment depending on the final design of the Proposed Development.
Visual receptors in the vicinity of Tickton	Construction, operation and decommissioning	Potential views from receptors in and around the settlement of Tickton; for local residents and visitors to the area. Views of solar arrays are considered unlikely, but there is considered to be potential visual impacts from taller on-site substation infrastructure. However, these receptors could potentially be scoped out of further assessment depending on the final design of the Proposed Development.
Visual receptors in the vicinity of Routh	Construction, operation and decommissioning	Potential views from receptors in and around the settlement of Routh, including High Farm Holiday Park and Heron Lakes; for local residents and visitors to the area.
Visual receptors in the vicinity of Long Riston	Construction, operation and decommissioning	Potential views from receptors in and around the settlement of Long Riston; for local residents and visitors to the area.
Visual receptors in the vicinity of Meaux	Construction, operation and decommissioning	Potential views from receptors in and around Meaux and the central landscape of the Site for local residents and visitors to the area.
Visual receptors in the vicinity of Weel	Construction, operation and decommissioning	Potential views from receptors in and around the settlement of Weel, and the landscape between the River Hull and the west of the Site; for local residents and visitors to the area.
Visual receptors in the vicinity of Woodmansey	Construction, operation and decommissioning	Potential views from receptors in the landscape to the west of the River Hull within the south-west of the study area, including Woodmansey and Thearne, users of Hull Road and visitors to Let Loose Adventure Park; for local residents and

		visitors to the area. Views of solar arrays are considered unlikely, but there is considered to be potential visual impacts from the underground cable corridor impacting landscape elements and pattern. However, these receptors could potentially be scoped out of further assessment depending on the final design of the Proposed Development.
Visual receptors in the vicinity of Wawne	Construction, operation and decommissioning	Potential views from receptors in and around the settlement of Wawne, and the landscape to the east of the River Hull within the south of the study area (excluding Kingswood); for local residents and visitors to the area.
Visual receptors in the vicinity of Benningholme	Construction, operation and decommissioning	Potential views from receptors within the landscape within the south-east of the study area between Kingswood, Skirlaugh and the Site boundary; for local residents and visitors to the area.
Visual receptors in the vicinity of Skirlaugh	Construction, operation and decommissioning	Potential views from receptors in and around the settlement of Skirlaugh; for local residents and visitors to the area.
Users of the River Hull	Construction, operation and decommissioning	Visitor attraction and host to house boats and the banks are PRoW. Runs north to south through the west of the study area and is in relative close proximity to different elements of the Proposed Development.
Users of the A1305 (includes NCN route no. 164)	Construction, operation and decommissioning	The A1305 runs broadly east to west through the centre of the study area from Beverley to Brandesburton and users would potentially have visibility of different elements of the Proposed Development for up to 8 km.
Users of the A165	Construction, operation and decommissioning	The A165 runs north to south through the south-east of the study area, for over 5 km, from Leven to Skirlaugh. The road is on a slight ridge in a level landscape and therefore affords views westwards across the Site.
Users of the PRoW Leven footpath no. 6	Construction, operation and decommissioning	Adjacent or close to Fields A1, A2 and A4. Potential for large scale changes in view from the PRoW.

Users of the PRoW Riston footpath no. 2 and Leven footpath no. 5	Construction, operation and decommissioning	Adjacent to the Site for 4.6 km and occasionally between field parcels. Adjacent or close to FieldsB1, B2, B3, B4, B7, B8, C1, C2, C3, C4, C5, C7 and C8. Potential for large scale changes in view from the PRoW.
Users of the PRoW Riston footpath no. 1	Construction, operation and decommissioning	Adjacent to the Site for 1.6 km and occasionally between field parcels. Adjacent or close to FieldsC4, C5, C6, C7, C8 and C9. Potential for large scale changes in view from the PRoW.
Users of the PRoW Tickton Bridleway no. 5	Construction, operation and decommissioning	Adjacent or close to Fields E13, E14 and E17. Potential for large scale changes in view from the PRoW.
Users of the PRoW Wawne footpath no. 1	Construction, operation and decommissioning	Adjacent or close to FieldsF16 and F17. Potential for large scale changes in view from the PRoW.
Individual residential properties within the 3 km study area	Construction, operation and decommissioning	Potential large scale of change from a relatively small number of isolated properties throughout the study area.
Users of the local roads within the 3 km study area	Construction, operation and decommissioning	Potential large scale of change from a relatively small number of roads throughout the study area.

6.6.9 Receptors/matters to be scoped out of further assessment

Receptor/Matter	Phase	Justification
National Character Area (NCA) Profile 40 – Holderness	Construction, operation and decommissioning	It is proposed to assess effects on landscape character with reference to the district scale LCAs rather than the NCA as these provide a more detailed scale of baseline assessment.
Lincolnshire Wolds AONB and Howardian Hills AONB	Construction, operation and decommissioning	These nationally important designations are both over 30 km from the Site and therefore would not be impacted by the Proposed Development.
Thwaite Hall, Risby Hall and Burton Constable Registered Parks and Gardens	Construction, operation and decommissioning	All over 6 km from the Site and any potential impacts would not be greater than negligible.

Yorkshire Wolds Important Landscape Area	Construction, operation and decommissioning	Over 5 km from the Site and any potential impacts would not be greater than negligible.
East Riding LCA 18B: Quarry Farmland	Construction, operation and decommissioning	Within the study area, but all potential impacts on the LCA would be indirect and landscape elements and pattern of the LCA would not be impacted by the Proposed Development. Any potential indirect impacts would be localised, would not impact key characteristics as identified in the ERYLCA, and are unlikely to be greater than negligible.
East Riding LCA 16E: Lund Sloping Farmland	Construction, operation and decommissioning	Within the study area, but all potential impacts on the LCA would be indirect and landscape elements and pattern of the LCA would not be impacted by the Proposed Development. Any potential indirect impacts would be localised , would not impact key characteristics as identified in the ERYLCA, and are unlikely to be greater than negligible.
East Riding LCA 18C: Catfoss Dyke	Construction, operation and decommissioning	Within the study area, but all potential impacts on the LCA would be indirect and landscape elements and pattern of the LCA would not be impacted by the Proposed Development. Any potential indirect impacts would be localised , would not impact key characteristics as identified in the ERYLCA, and are unlikely to be greater than negligible.
East Riding LCA 17A: Headon, Preston and Bilton Farmland	Construction, operation and decommissioning	Within the study area, but all potential impacts on the LCA would be indirect and landscape elements and pattern of the LCA would not be impacted by the Proposed Development. Any potential indirect impacts would be localised , would not impact key characteristics as identified in the ERYLCA, and are unlikely to be greater than negligible.
East Riding LCA 19A: Rise Parkland	Construction, operation and decommissioning	Within the study area, but all potential impacts on the LCA would be indirect and landscape elements and pattern of the LCA would not be impacted by the Proposed Development. Any potential indirect impacts would be localised , would not impact key characteristics as identified in the ERYLCA, and are unlikely to be greater than negligible.

East Riding LCA 19C: North Holderness: Open Farmland	Construction, operation and decommissioning	Within the study area, but all potential impacts on the LCA would be indirect and landscape elements and pattern of the LCA would not be impacted by the Proposed Development. Any potential indirect impacts would be localised , would not impact key characteristics as identified in the ERYLCA, and are unlikely to be greater than negligible.
Wilfholme	Construction, operation and decommissioning	Separated from the Site (Land Area A) by the River Hull. The distance from solar array fields and intervening landform and vegetation mean that whilst there may be occasional glimpsed views of the Proposed Development, the potential impact on visual amenity would not be greater than negligible adverse.
Beverley	Construction, operation and decommissioning	The distance from solar array fields and intervening built form and vegetation mean that whilst there may be occasional glimpsed views of the Proposed Development, the potential impact on visual amenity would not be greater than negligible adverse.
Kingswood	Construction, operation and decommissioning	The distance from the Site and intervening built form and vegetation mean that whilst there may be occasional glimpsed views of the Proposed Development, the potential impact on visual amenity would not be greater than negligible adverse.
Lighting impacts on landscape character and visual amenity	Construction, operation and decommissioning	In general, it is anticipated that the Proposed Development would not be lit; however, infrared security lighting would be required around key electrical infrastructure. This lighting would be sensor triggered and therefore not continuous. Potential lighting impacts on landscape character and visual amenity would not be greater than negligible adverse.
Vistas of Beverley Minster identified in the East Riding of Yorkshire Landscape Character Assessment	Construction, operation and decommissioning	The low-level solar development would not affect any recorded and important vistas of Beverley Minster, as defined in the East Riding of Yorkshire Landscape Character Assessment.

6.6.10 Opportunities for enhancing the environment

A comprehensive landscape mitigation strategy for the Proposed Development will be developed and this will seek to deliver significant landscape, as well as biodiversity, enhancement.

6.6.11 Proposed assessment methodology

The LVIA will be undertaken in accordance with published best practice namely the 'Guidelines for Landscape and Visual Impact Assessment (Third Edition)', Landscape Institute and IEMA 2013 (GLVIA3) and associated technical guidance notes published by the Landscape Institute, as detailed below.

"Landscape and Visual Impact Assessment is a tool used to identify and assess the significance of and the effects of change resulting from development on both the landscape as an environmental resource in its own right and people's views and visual amenity." (GLVIA3, paragraph 1.1).

In addition to GLVIA3, other associated technical guidance notes of relevance to the assessment published by the Landscape Institute include:

- Technical Guidance Note 06/19: Visual Representation of Development Proposals, published by the Landscape Institute (2019).
- Technical Guidance Note 02/21: Assessing landscape value outside national designations.
- Technical Guidance Note 02/19: Residential Visual Amenity Assessment.
- Technical Guidance Note 04/20: Infrastructure.

Wherever possible, identified effects are quantified, but the nature of landscape and visual assessment requires interpretation using professional judgement. In order to provide a level of consistency to the assessment, the prediction of magnitude and assessment of significance of the residual landscape and visual effects will be based on pre-defined criteria.

GLVIA3 states that *"professional judgement is a very important part of the LVIA'* (paragraph 2.23) and that *'in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others."* (paragraph 2.24). It goes on at paragraph 3.32 to state that *"there are no hard and fast rules about what effects should be deemed 'significant' but LVIAs should always distinguish clearly between what are considered to be the significant and non-significant effects."*

The LVIA will define the existing landscape and visual baseline environment; assess its sensitivity to change; describe the key landscape and visual related aspects of the Proposed Development; describe the nature of the anticipated changes and assess the effects arising during construction, operation and decommissioning.

Although linked, landscape and visual effects are considered separately. Landscape effects derive from changes in the landscape fabric, which may result in changes to the character, whereas visual effects are the effect of these changes as experienced by people (visual receptors).

The specific significance criteria to be used in the LVIA are set out in **Appendix D**.

All above ground primary and secondary elements of the Proposed Development will be considered in the LVIA as visible features which either individually or collectively have the potential to give rise to significant landscape and visual effects.

A selection of viewpoints, agreed with East Riding of Yorkshire Council, will be used in the LVIA to consider effects on different receptor groups, at various distances from the Site and to illustrate any particularly sensitive views identified through scoping.

Annotated photographs will be provided for each of the assessment viewpoints used in the LVIA. The annotated photographs will accord with guidance for 'Type 1' visualisations as defined in Landscape Institute Technical Guidance Note 06/19 (TGN 06/19).

A series of photomontages will be presented for key viewpoints (locations to be determined through further consultation). The photomontages will be produced using the same base photographs as the annotated photographs and accord with guidance for 'Type 3' or 'Type 4' visualisations as defined in TGN 06/19.

Mitigation measures will be developed as appropriate and taken into consideration in the assessment of effects. Operational phase effects will be assessed in Year 1 and Year 10.

The LVIA will conclude by summarising which if any effects are considered to be 'significant'.

As set out within LI Technical Guidance Note 02//19 'Residential Visual Amenity Assessment':

"Changes in views and visual amenity are considered in the planning process. In respect of private views and visual amenity, it is widely known that, no one has 'a right to a view."

And:

"It is not uncommon for significant adverse effects on views and visual amenity to be experienced by people at their place of residence as a result of introducing a new development into the landscape. In itself this does not necessarily cause particular planning concern. However, there are situations where the effect on the outlook/visual amenity of a residential property is so great that it is not generally considered to be in the public interest to permit such conditions to occur where they did not exist before."

The LVIA will present, as an appendix to the main assessment, a residential amenity assessment of visual effects on residential properties for any property where these is a possibility that the visual effects may approach the threshold described above.

Cumulative landscape and visual effects will be assessed as appropriate. Other projects to be considered in the cumulative LVIA will be identified through stakeholder consultation.

6.6.12 Difficulties and uncertainties

No difficulties or uncertainties with regards the LVIA have been identified at this stage.

6.6.13 References

- Guidelines for Landscape and Visual Impact Assessment, Third Edition, Landscape Institute and Institute of Environmental Management & Assessment (2013).

- Landscape Institute Technical Guidance Note 06/19: Visual Representation of Development Proposals, published by the Landscape Institute (2019)
- Landscape Institute Technical Guidance Note 02/21: Assessing landscape value outside national designations
- Landscape Institute Technical Guidance Note 02/19: Residential Visual Amenity Assessment
- Landscape Institute Technical Guidance Note 04/20: Infrastructure
- National Character Area Profile (NCA) 40–- Holderness, Natural England, 2015. Available online: https://publications.naturalengland.org.uk/publication/8569014
- East Riding of Yorkshire Landscape Character Assessment, AECOM, 2018. Available online: here
- East Riding of Yorkshire Local Plan (adopted April 2016). Available online: https://www.eastriding.gov.uk/planning-permission-and-building-control/planning-policy-and-the-local-plan/east-riding-local-plan/

6.6.14 Scoping questions

- Do you agree with the proposed list of consultees?
- Do you agree with the proposed LVIA study areas?
- Do you agree that the data sources listed to inform the LVIA are appropriate?
- Do you agree that the surveys proposed to inform the LVIA are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the LVIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the landscape and visual receptors that are proposed to be scoped in and out of further assessment?
- Do you agree with the proposed factor-specific assessment approach?
- Are there any specific viewpoints that you would like us to consider and/or illustrate as a photomontage?
- Are there any other developments which you consider it will be necessary for us to address in a cumulative landscape and visual impact assessment?

6.7 Noise and vibration

6.7.1 Consultation

No consultation regarding the noise and vibration assessment has been undertaken to date.

The local Environmental Health department at East Riding of Yorkshire Council will be consulted, and agreement sought where possible on the following:

- Baseline noise survey locations and programme of monitoring;

- Guidance and standards pertinent to the assessment(s);
- Receptors for inclusion in the assessment(s) where necessary; and
- Relevant assessment criteria.

6.7.2 Study area

For the assessment of noise and vibration during construction and decommissioning, the study area is proposed to be noise and vibration sensitive receptors located within 300 m from the Site boundary. This has been determined based on relevant guidance as set out in British Standard (BS) 5228-1:2009+A1:2014–- *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Noise,* BS 5228-2:2009+A1:2014–- *Code of Practice for Noise and Vibration Control on Construction and Open Sites – Vibration* and *Design Manual for Roads and Bridges (DMRB) LA 111 – Noise and Vibration'*.

For the assessment of operational phase noise levels, the study area extends out to the nearest or most exposed noise sensitive receptors to the Site boundary.

6.7.3 Data sources to inform the EIA baseline characterisation

The following sources of information have informed the scope of the baseline surveys:

- Site boundary – detailing extents of the Proposed Development location and proximity to nearby receptors;
- Online aerial imagery – determine locations of nearest receptors to inform both the baseline survey and future assessment(s); and
- Natural England SSSI map (Defra).

6.7.4 Surveys to inform the EIA baseline characterisation

A comprehensive baseline noise survey is proposed to quantify and characterise the existing noise environment across the study area and at nearest sensitive receptors.

It is proposed to undertake a baseline noise monitoring exercise in accordance with BS 7445-1:2003 *'Description of environmental noise – Guide to quantities and procedures'*, and the equipment used will conform to the requirements of BS EN 61672-1:2013 *'Electroacoustics. Sound level meters. Specifications'*.

Monitoring will be undertaken in the form of long-term noise measurements, typically of 1-week duration, in order to quantify the existing noise environment and sources of noise impacting the assessment receptors. Monitoring will encompass continuous periods throughout daytime and night, accounting for the likely operational times of the Proposed Development (i.e. 24 hours per day, 7 days per week).

Baseline monitoring will be used to inform the criteria for both the construction and operational phases.

Monitoring will likely occur at positions representative of those nearest receptors; in many cases, this would be along the Site boundary. The monitoring equipment will not be installed at positions which inhibit the use of PRoW. Where positions along the Site boundary are deemed to not be representative of nearby receptors, positions will be

chosen within the boundary of the sensitive receptor (through agreement with the property owner).

6.7.5 Baseline conditions

Sensitive receptors positioned closest to existing sources of noise, such as transportation and/or industrial development, would be expected to experience the highest baseline noise levels within the study area.

Review of aerial imagery indicates that the baseline environment would likely be influenced by vehicle movements along the local road network, including A1035 and A165, intermittent light aircraft from Beverley Airfield and existing farming/agricultural activity. Noise levels from these activities would be captured as part of the baseline noise survey; no further significant sources of noise are noted.

The receptors likely to be incorporated into the assessment are all residential in nature and therefore have the highest level of sensitivity. Specific settlements likely to be incorporated within the study area include individual receptors within the villages of Leven, Long Riston, Weel and Warne.

6.7.6 Additional (secondary and tertiary) mitigation

Construction

In developing the control measures during the construction phase of the Proposed Development, best practicable means (BPM), as defined in Section 72 of the Control of Pollution Act 1974 and Section 79 of the Environmental Protection Act 1990, would be applied during all construction works to minimise noise (including vibration) at neighbouring residential properties and other sensitive receptors. In doing so, due consideration would be given to the recommendations contained within BS5228:2009+A1:2014.

Measures to minimise levels of noise and vibration during the construction phase may include:

- The use of lower emitting noise level plant items;
- Management of operations to more appropriate periods;
- Use of noise barriers/temporary enclosures; and
- Sensitive routing of construction traffic, both within the Site and on the public highway.

Operation

When choosing attenuation measures or implementing an effective noise reduction program for the Proposed Development, there are two possible approaches for treatment:

- Mitigation at source – modify the source to radiate at a lower noise level; and
- Mitigation through transmission – deflect or block the acoustic path of noise.

It should be noted that this list of additional mitigation is not exhaustive, the specifics of which (and the extent) would be determined as part of the assessment.

Decommissioning

Measures outlined as part of the construction phase would likely be applied during the decommissioning phase of the Proposed Development in accordance with BS5228:2009+A1:2014.

6.7.7 Description of likely significant effects

Construction

The construction phase of the Proposed Development would likely lead to an increase in existing noise levels at receptors as a result of the use of large earthmoving/lifting equipment, plus an increase in vehicle/HGV numbers along the road network and new access tracks. Temporary significant effects may occur during this phase.

Operation

The operational phase of the Proposed Development will inevitably introduce new noise sources into the locality, with those sources having the potential to be tonal in nature. Given the likely low background noise levels, particularly during the night-time period, the potential impact of the Proposed Development may be significant and permanent at a number of existing receptors.

Decommissioning

The decommissioning phase of the Proposed Development would likely lead to an increase in existing noise levels at receptors as a result of the use of large earthmoving/lifting equipment, plus an increase in vehicle/HGV numbers along the road network and new access tracks. Temporary significant effects may occur during this phase.

6.7.8 Receptors/matters to be scoped into further assessment

Receptor/Matter	Phase	Justification
Noise	Construction and decommissioning	Activities likely to involve large earthmoving/lifting plant items with the potential for significant effects to occur.
Road traffic	Construction and decommissioning	Potential increase in HGV/vehicle movements may cause significant effects in the short term.
Vibration	Construction and decommissioning	Activities likely to involve large earthmoving/lifting plant items with the potential for significant effects to occur.
Noise	Operation	Operational plant items are likely to have an impact on the existing noise environment and affect local amenity.
Tophill Low SSSI	Construction and decommissioning	Tophill Low SSSI is located 365 m north of Land Area A and is designated for wintering wildfowl; potential noise impacts as a result of

		construction and decommissioning activities therefore require further investigation.

6.7.9 Receptors/matters to be scoped out of further assessment

Receptor/Matter	Phase	Justification
Vibration	Operation	Operational elements including fixed plant items/structures will not emit discernible levels of vibration.
Road traffic	Operation	The increase in road traffic during operation is likely to be negligible, with vehicles only likely to be required for routine maintenance.
Tophill Low SSSI	Operation	This site does not lie within the Site boundary. Any noise emitted from the operational Proposed Development would be continuous in nature, leading to minimal disturbance on the wintering wildfowl for which this site is designated. Furthermore, it is considered that over time, the birds would habituate to any noise emissions.

6.7.10 Opportunities for enhancing the environment

No opportunities for enhancement in relation to noise and vibration have been identified at this stage.

6.7.11 Proposed assessment methodology

Noise and vibration will be quantified using computational noise modelling. Calculations will be based on algorithms set out in ISO 9613-2:1996 'Acoustics — Attenuation of sound during propagation outdoors — Part 2: General method of calculation', BS 5228-1:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites. Noise'*, BS 5228-2:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites. Vibration'* and DMRB *'LA 111 Noise and Vibration, 2020'*.

Those phases of assessment comprise:

- Construction – infrastructure including fixed plant and road traffic;
- Operational – infrastructure fixed plant; and
- Decommissioning – infrastructure including fixed plant and road traffic.

Computational noise modelling

Noise modelling will be undertaken using nationally recognised modelling software (SoundPLAN v8.2) and widely accepted modelling algorithms (Calculation of Road Traffic Noise (CRTN) for road traffic, ISO 9613 for industrial and BS 5228 for

construction). Data gathered during the baseline noise monitoring survey would be used in conjunction with local terrain data and masterplans to generate a model of the proposals. The computer noise model will take into account existing and future terrain data, any existing or proposed mitigation schemes and any existing or proposed structures.

The noise model would utilise the plant noise source data to predict likely noise levels at those closest receptors. Information such as construction areas and durations, would all feed into the model. Where information is not provided, datasheets from the plant manufacturer or in-house data, measured from similar plant items would be used for prediction purposes.

The computer noise model output will provide site-wide noise contour plots and visually depict how the noise will likely attenuate across the Site. The model would allow for predictions at nearby receptors to determine compliance with the appropriate assessment criteria and assist, where applicable, with project specific mitigation measures.

Construction assessment

The construction assessment would account for the following (primary) activities:

- Groundworks – cut and fill activities, access tracks, site establishment;
- Cable trenching;
- Vehicle/HGV movements; and
- Installation/modification of infrastructure – to include photovoltaic system, BESS, the two on-site substations, modifications to the National Grid substation at Creyke Beck and grid connections.

The contribution of the different construction activities would be assessed in line with the guidance in BS 5228-1:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites – Noise'*, plus any specific requirements of East Riding of Yorkshire Council. Where construction noise levels are considered to be excessive or intrusive, recommendations for noise control measures would be made.

The impact of construction traffic on the existing road network would be assessed in accordance with the requirements of DMRB 'LA 111 Noise and Vibration, 2020'. The assessment would determine the level of noise increase in the short term, due to the inclusion of construction traffic on the existing network.

In terms of vibration impacts, sensitive receptors and possible vibration generating construction activities would be identified. Activities which may have the potential to generate perceptible levels of vibration at sensitive receptors, or levels which may cause early signs of cosmetic or structural damage include, but are not limited to, piling, rolling and compaction. Where these activities are identified as occurring within the construction programme and within a short separation distance from a sensitive receptor, predictions of possible vibration levels would be made using guidance contained within BS 5228-2:2009+A1:2014 *'Code of practice for noise and vibration control on construction and open sites – Vibration'*, and through empirical formulae. Predicted vibration levels would be assessed against appropriate criteria within BS 5228-2. Where the impact is predicted to be high or significant as a result of construction induced vibration, control measures would be recommended, including the specification of minimum distances from construction.

Operational assessment

The operational assessment would account for the following (primary) activities:

- Inverter/transformer stations;
- Substations and switchgear stations;
- BESS containers and inverters; and
- Two on-site substations and National Grid substation at Creyke Beck (including proposed new and modifications to existing equipment).

Operational impacts will be assessed to the requirements of BS 4142:2014+A1: 2019 *'Methods for rating and assessing industrial and commercial sound'.* Noise predictions of the Proposed Development, derived from the computer noise modelling, will be compared with the existing background noise level ($L_{A90, T}$) at the nearest receptors to determine the level of impact. The assessment will utilise information regarding the number, type and noise emission data for the proposed fixed plant operating on the Site, in addition to the Site layout.

Where the assessment identifies potential and unreasonable impacts, guidance on potential noise control methods for the fixed plant and machinery will be provided (typically noise barriers, enclosures etc.). This will ensure the final design of the proposed installations can be developed to incorporate the required noise mitigation.

Decommissioning assessment

The impact of decommissioning activities will follow the assessment outlined above as part of the construction phase. At this stage, it is assumed that activities would not be significantly different to those proposed during construction, merely in reverse order. Where appropriate, the contribution of decommissioning and the movement of vehicles/HGVs would be assessed in accordance with BS 5228-1:2009+A1:2014 and DMRB 'LA 111 Noise and Vibration, 2020'.

6.7.12 Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified:

- The overview of baseline acoustic conditions is based on desk-based studies only at scoping stage.
- The construction assessment will assume the use of standard construction techniques appropriate for the type of works being undertaken. The final techniques, plant selection and programme are expected to be determined by the appointed contractor, in consultation with relevant authorities prior to commencement of construction.
- Details of noise emitting plant/equipment associated with the Proposed Development have not been defined at this stage.

6.7.13 References

- British Standards Institution (2019), 'British Standard 4142: 2014+A1: 2019, Methods for rating and assessing industrial and commercial sound'.

- British Standards Institution (2014), 'British Standard 5228-1: 2009+A1: 2014, Code of practice for noise and vibration control on construction and open sites – Noise'.
- British Standards Institution (2014), British Standard 5228-2: 2009+A1: 2014, Code of practice for noise and vibration control on construction and open sites – Vibration.
- British Standards Institution (2003), British Standard 7445-1:2003, Description and measurement of environmental noise – Part 1: Guide to quantities and procedures.
- British Standards Institution (2014), British Standard 8233: 2014, Guidance on sound insulation and noise reduction for buildings.
- Cutts, N., Phelps, A. and Burdon, D. 2009. 'Construction and waterfowl: Defining Sensitivity, Response, Impacts and Guidance'. Report to Humber INCA, Institute of Estuarine and Coastal Studies, University of Hull.
- Design Manual for Roads and Bridges (2020), LA 111 Noise and Vibration
- Drewitt, A., Hawthorne, E., Sauders, R. and Anthony, S. 2018. 'A Review of the Effects of Noise on Birds – Version 1'. Natural England
- International Standards Organization (1996), ISO 9613-2:1996, Acoustics. Attenuation of Sound During Propagation Outdoors. Part 2: General Method of Calculation.
- National Planning Policy Framework 2023. Available online: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1182995/NPPF_Sept_23.pdf
- Noise Policy Statement for England (2010), Department for the Environment and Rural Affairs, 2010
- Planning Practice Guidance (PPG) – Noise (2019), Department for Levelling Up, Housing and Communities, 2019
- Welsh Office HMSO (1988), Department of Transport, 'Calculation of Road Traffic Noise'.
- World Health Organization, Guidelines for Community Noise, 1999

6.7.14 Scoping questions

- Do you agree with the proposed study areas for both construction/ decommissioning and then operation?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?

- Do you agree with the receptors/matters that are proposed to be scoped in and out of further assessment?
- Do you agree with the proposed factor-specific assessment approach?

6.8 Transport and access

6.8.1 Consultation

At the time of writing, initial contact has been made with East Riding of Yorkshire Council as the Local Highway Authority to enquire about available traffic data and to commence discussions regarding the scope of the Transport Assessment (separate to the EIA).

Whilst some of the deliveries to the Site (assuming containerised components) are likely to be deliveries via the Port of Hull and a section of the A63, it is not anticipated that the Site will have a material impact on National Highways' Strategic Road Network (SRN) and therefore National Highways has not been consulted at this stage. However, it is likely that the Applicant will make National Highways aware of the proposals once routing and estimated construction traffic flows are confirmed.

Discussions with landowners (over whose land access is required for construction traffic) have been ongoing and options for rights of access over third-party land have been agreed, where required.

6.8.2 Study area

Based on Rules 1 and 2 of the 'Guidelines for the Environmental Assessment of Traffic and Movement' (IEMA, 2023), the study area is likely to comprise the following links within the highway network, which will be kept under review as the project develops. Private roads will not be assessed as they fall outside of the highway network as defined by the IEMA (2023) Guidelines:

- A1035 (between A1174 roundabout and A165 Brandesburton roundabout);
- A165 (between Brandesburton and Crab Tree Lane);
- New Road/Starcarr Lane, Brandesburton;
- West Street, Leven;
- East Street, Leven;
- Hornsea Rd, Leven;
- Heigholme Lane;
- Carr Lane, Leven (west of West Street & Heighholme Lane);
- Meaux Lane/Meaux Road/Wawne Road (between A1035 and Bude Road roundabout);
- Carr Lane, Long Riston;
- Arnold Lane West, Arnold/Long Riston;
- Black Tup Lane, Arnold/Long Riston;

- Benningholme Lane, Skirlaugh;
- Ings Lane (West of Skirlaugh);
- Woodhouse Lane (West of Skirlaugh); and
- Field House Farm (west side of Field House Farm).

This study area has been identified assuming that the majority of the total construction traffic (including staff trips) would travel to the Site along the above links to access the Site.

It is noted that in addition to the above, there are other highway links which a small proportion of arrivals/departures will use as the construction/maintenance and decommissioning trips are likely to be spread across a series of access points.

The extent of the study area is to be discussed and agreed with East Riding of Yorkshire Council prior to assessment following agreement of the access locations and construction traffic routing.

It should be noted that the phasing of construction (the order in which the Land Areas are constructed/assembled) and location of site compound(s) are currently unknown, but once confirmed, will determine for how long each route experiences construction traffic.

6.8.3 Data sources to inform the EIA baseline characterisation

Existing relevant Department for Transport (DfT) traffic count data are available along the following links within the study area, which will be reviewed in reference to construction traffic routing to each respective access and will be considered in line with traffic estimate data provided by the Applicant for the construction phase of the Proposed Development:

- A1035:
  - DfT count site number 37558, west of White Cross Roundabout, latest manual count 2019;
  - DfT count site number 36752, south of Leven Roundabout, latest manual count 2021;
- A165:
  - DfT count site number 6712, north of Brandesburton Roundabout, latest manual count 2020;
- A165 White Cross Road:
  - DfT count site number 16700, north of Vicarage Lane, Skirlaugh, latest manual count 2018; and
- Meaux Lane:
  - DfT count site number 931514, north of Meaux Livery/Abbey Farm, latest manual count 2009.

Information on the adopted highway boundary is required and will be requested from East Riding of Yorkshire Council upon agreement with the Applicant on the proposed access routes and points. The extent of the highway boundary will be important for identifying where mitigation such as passing places can be achieved.

Personal Injury Collision data will be obtained from CrashMAP/RSK's internal portal of accident data/East Riding of Yorkshire Council. The most recent three year period available will be reviewed for the identified highway links to identify any patterns in road traffic collisions which may need to be considered as part of the assessment.

6.8.4 Surveys to inform the EIA baseline characterisation

Supplementary traffic surveys may be required where there is no East Riding of Yorkshire Council or DfT data available or the data cannot be used as it is out of date. At the majority of the links identified above, it will be necessary to carry out directional, classified traffic surveys to determine the existing flows across a neutral 24 hour period. Before the surveys are carried out, East Riding of Yorkshire Council will be consulted on whether they have any annual average daily traffic (AADT) link count data for the identified links in the study area. Where this is unavailable, surveys will be required. The traffic data obtained will be used to determine the assessment year flows and the likely impact of development-related traffic on AADT flows.

A topographical survey has been produced of the Site and Ordnance Survey mapping used for off-site sections of the study area and areas of public highway. This will be used for the purpose of undertaking Swept Path Assessments (SPA) and access junction designs (concept design). Site visits will be undertaken to understand where proposed vehicle access routes are particularly narrow and how any constraints can be overcome without a significant adverse impact.

6.8.5 Baseline conditions

The existing land use of the Site and areas surrounding the Site is predominantly agricultural and there are several drains and dikes which pass through the Site, which are a minor constraint to access. The Site is in proximity to the residential settlements of Brandesburton, Arnold, Riston, Tickton, Weel, Wawne and Skirlaugh.

A preliminary review of the DfT online traffic data portal suggests that historic traffic counts are available for most of the major roads in the study area approaching the Site. However, it is likely that traffic surveys will be required, as noted above (**Section 6.8.4**).

6.8.6 Additional (secondary and tertiary) mitigation

Construction

At the construction stage of the Proposed Development, specific mitigation cannot be identified. However, it is assumed that some minor highway works may be required to facilitate access to the Site and where detailed assessments demonstrate mitigation is required, then options will be explored (such as temporary or permanent passing places or small increases in carriageway width (subject to available highway or third-party land)). These will be identified in the associated Transport Assessment with supporting plans. An Outline Construction Traffic Management Plan will be developed and submitted in support of the DCO application. It is anticipated that a detailed Construction Traffic Management Plan will be secured by a DCO requirement to mitigate against the effects of construction traffic on the local highway network, both in

terms of traffic routing, timing of construction arrivals and departures and minimising any mud and debris on the highway.

Operation

It is assumed that whatever mitigation is required for the construction phase of the Proposed Development (such as passing places) may be retained in the operational phase of the Proposed Development (subject to the requisite agreements with East Riding of Yorkshire Council).

Decommissioning

It is assumed that whatever mitigation is required for the construction phase may also be required during the decommissioning phase of the Proposed Development. The decommissioning phase is likely to have a lower potential impact to the construction phase, and a shorter duration (than construction). Where mitigation such as passing places are installed (subject to agreement with East Riding of Yorkshire Council), these may become legacy schemes to benefit the community beyond the construction stage and could therefore be used during the decommissioning phase.

6.8.7 Description of likely significant effects

The following potential impacts will be considered in the assessment in line with the IEMA Guidelines (para. 3.3 - Environmental Assessment of Traffic and Movement, 2023)

(a) Severance of communities;
(b) Road vehicle driver and passenger delay;
(c) Non-motorised user delay;
(d) Non-motorised amenity;
(e) Fear and intimidation on and by road users;
(f) Road user and pedestrian safety; and
(g) Hazardous/large loads.

The potential for likely significant effects on each receptor/resource scoped into the assessment is set out in **Section 6.8.8** below.

6.8.8 Receptors/matters to be scoped into further assessment

The locations identified in the table below have been scoped into the assessment:

Construction Effects

Receptor	Potential for LSE*	Nature of Effect**	Reasons on available evidence
A1035 & A165	Low	(b), (g)	Used by most construction traffic to access the Site.
New Road/Starcarr Lane, Brandesburton	Medium	(b), (g), (d), (f)	Passes through village/residential area
West Street, Leven	Medium	(b), (g),	Passes through

East Street, Leven		(d), (f)	village/residential area
Hornsea Rd, Leven	Medium	(b), (g), (d), (f)	Passes through village
Heigholme Lane	High	(b), (c), (g)	Long length narrow lane
Carr Lane, Leven (west of West Street & Heighholme Lane)	Low	(b), (g)	Low number of receptors affected
Meaux Lane/Meaux Road/Wawne Road (between A1035 and Bude Road roundabout)	Medium	(b), (c), (g)	Long length of highway – limited passing places currently
Carr Lane, Long Riston	Low	(b), (g)	Low number of receptors affected
Arnold Lane West, Arnold/Long Riston	High	(b), (g), (d), (f)	Passes through village/residential area
Black Tup Lane, Arnold/Long Riston	Medium	(b), (g), (d), (f)	Passes through village/residential area
Benningholme Lane, Skirlaugh	Medium	(b), (g), (d), (f)	Passes through village/residential area
Ings Lane (West of Skirlaugh)	High	(b), (g)	Low number of receptors affected
Woodhouse Lane (West of Skirlaugh)	High	(b), (g)	Low number of receptors affected
Field House Farm (west side of Field House Farm)	High	(b), (g)	Low number of receptors affected

*LSE – Likely Significant Effects

**Impact/Effect Categories:

(a) Severance of communities;
(b) Road vehicle driver and passenger delay;
(c) Non-motorised user delay;
(d) Non-motorised amenity;
(e) Fear and intimidation on and by road users;
(f) Road user and pedestrian safety; and
(g) Hazardous/large loads.

6.8.9 Receptors/matters to be scoped out of further assessment		
Receptor/Matter	**Phase**	**Justification**
All	Operation	Once the Proposed Development is operational, the effect on the local road system is expected to be negligible. Access will be required from time to time for routine maintenance, and less frequently for major maintenance and upgrades. Therefore, it is not expected that the changes in traffic on the existing network will change by more than 10% for HGVs or 30% for all vehicle movements during the operational phase, these being defining thresholds for environmental effects on the local transport network.
All	Decommissioning	The effects may be mitigated by the beginning of the phase (anticipated to be no earlier than the 2060s) as local and regional highway schemes will likely be brought forward during that period. Nonetheless, the effects are predicted to be less than the construction effects

6.8.10 Opportunities for enhancing the environment
As the potential traffic impacts of the Proposed Development are temporary in nature, there would be no other ability to provide further future transport enhancements beyond mitigations such as passing places, which could be kept in place permanently to benefit the travelling public.

6.8.11 Proposed assessment methodology
The assessment of the traffic and movement environmental impacts and their significance will be undertaken in accordance with the 'Guidelines for the Environmental Assessment of Traffic and Movement' (IEMA, 2023). This guidance provides two broad rules to be used as a screening process to identify the appropriate extent of the assessment area and likelihood of impacts. These are: *"Rule 1 - Include highway links where traffic flows would increase by more than 30% (or the number of HGVs would increase by more than 30%); and* *Rule 2 - Include any other specifically sensitive areas where traffic flows would increase by 10% or more."* Where the predicted increase in traffic flow is lower than the thresholds, the Guidelines suggest the significance of the effects can be stated to be low or insignificant and further detailed assessments are not warranted.

Where construction traffic flows are predicted to exceed these thresholds, the significance of traffic and movement effects (including cumulative) will be determined by assessing the sensitivity of receptors against the magnitude of change to categorise significance as 'Major', 'Moderate', 'Minor' or 'Negligible'. The environmental effects that will be assessed are namely:

(a) Severance of communities;
(b) Road vehicle driver and passenger delay;
(c) Non-motorised user delay;
(d) Non-motorised amenity;
(e) Fear and intimidation on and by road users;
(f) Road user and pedestrian safety; and
(g) Hazardous/large loads.

Further detail on the significance criteria that will be applied is presented in **Appendix D**.

Note on percentage vs. absolute traffic/HGV increases

*The assessment will be undertaken in accordance with the "Guidelines for the Environmental Assessment of Traffic and Movement" (IEMA, 2023) Rules 1 and 2. It should, however, be noted that the majority of the road network which it is necessary to scope in will experience a very low **absolute** increase in HGV trips even though this may result in a large **percentage** increase in HGVs (compared to existing traffic flows). For example, some of the minor roads assessed are 'No Through' C class Roads and only serve a single farm. Clearly in these cases, a professional view will be taken during assessment as to whether the impact is significantly adverse.*

6.8.12 Difficulties and uncertainties

The assessment of construction traffic for the Proposed Development will assume the use of standard construction techniques appropriate for the type of works being undertaken. The final techniques, plant selection and programme are expected to be determined by the appointed contractor, in consultation with relevant authorities, where appropriate, prior to commencement of construction.

6.8.13 References

- Institute of Environmental Assessment (IEMA) Guidelines: Environmental Assessment of Traffic and Movement (2023)

6.8.14 Scoping questions

- Do you agree with the proposed list of consultees?
- Are there any other key stakeholders or stakeholder organisations that should be consulted?
- Do you agree with the proposed study area(s)?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?

- Are there any additional data sources or guidance documents that should be considered?
- Do you agree that the surveys proposed to inform the EIA baseline characterisation are appropriate?
- Do you agree that the identification of what constitutes the baseline environment is appropriate and that all relevant receptors have been identified?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree that all potentially significant effects have been identified?
- Do you agree with the receptors/elements that are proposed to be scoped in and out of further assessment?
- Do you agree with the proposed factor-specific assessment approach?

6.9 Population

6.9.1 Consultation

No consultation regarding the population assessment has been undertaken to date.

It is envisaged that consultation will be undertaken with East Riding of Yorkshire Council Public Rights of Way Officers to discuss and agree approaches to PRoW diversions/closures and details of any new PRoW.

6.9.2 Study area

There is no statutory guidance when assessing potential impacts to population. However, DMRB 'LA 112 Population and Human Health' (hereafter 'LA 112') provides direction when assessing the impacts of a project in relation to population and human health. Whilst it is recognised that DMRB is primarily for use when assessing transport-related developments, in the absence of other guidance, the LA 112 scoping methodology has been adopted as it is seen as a robust and recognised form of guidance when undertaking EIA. As described in LA 112; the study area for an assessment of effects relating to population will include all land within the Site boundary and then extends for 500 m in all directions beyond the Site boundary. If during the assessment it is identified there are other receptors close to or just beyond this study area, then they will also be considered in the EIA.

6.9.3 Data sources to inform the EIA baseline characterisation

- OS mapping, Defra's Magic maps and site plans have been used to describe the baseline of the Site in relation to population (**Section 6.9.5** below).
- DMRB LA 112 will be used to guide the information presented in the subsequent PEIR and ES baseline descriptions.

- An Outline Public Rights of Way Management Plan will be produced and submitted in support of the DCO application. This Outline Public Rights of Way Management Plan will outline the planned changes to PRoW and how any such changes are to be managed to minimise impacts to receptors. The information contained in this document will be used to inform the EIA.

6.9.4 Surveys to inform the EIA baseline characterisation

No surveys have been undertaken to date and none are expected to inform the assessment.

6.9.5 Baseline conditions

Private property and housing

There are no properties or houses at risk of demolition to construct/operate the Proposed Development.

None of the land to be used is allocated for residential development and no new planning applications have been submitted for housing development within the Site boundary.

Community land and assets

The Proposed Development will cover a large area of agricultural land which is therefore land not used as community land. There are no community assets located within the Site boundary.

Agricultural land holdings, development land and businesses

The existing Site comprises land used for agricultural purposes with associated farm holdings and private tracks. There are eight farming operations in and around the Site with two farms run by tenant farmers and the rest worked by the farm owners.

There are no other businesses present within the Site boundary. There is no land allocated for employment use, nor are there any planning applications yet to be determined that will generate employment opportunities at the Site.

Walkers, cyclists and horse riders

As noted above at **paragraph 2.4.16** in **Chapter 2**, numerous PRoW cross the Site and continue on beyond the Site boundary in various directions connecting with surrounding settlements (see **Appendix B**). None of these PRoW are designated national trails. It is assumed that these PRoW are used regularly by walkers, cyclists or horse riders as a means of travelling or for leisure purposes or for farm machinery to move around farm land.

6.9.6 Additional (secondary and tertiary) mitigation

During construction, where it is not possible to avoid diversions or closures of existing PRoW, any new permanent and alternative PRoW will be designed with the aim of replicating or improving the length of the route, the quality and safety feel of the route and the accessibility for all users. Any proposed changes to PRoW will be agreed in consultation with East Riding of Yorkshire Council in order to ensure there are suitable diversions or replacements in place.

Any temporary diversions will be detailed in an Outline Public Rights of Way Management Plan, setting out the PRoW commitments, which will be submitted in support of the DCO application. This will contain a section to specifically address what impacts, if any, will occur for any walkers, cyclists or horse riders using PRoW.

Once operational, the PRoW will either be available to use in the same manner as pre-construction, or the new routes for PRoW will be in place and open to use. No additional mitigation during operation is therefore needed.

6.9.7 Description of likely significant effects

All existing PRoW will be retained in their existing alignment wherever possible. However, it is possible that PRoW in and around the Site will need to be temporarily diverted or permanently stopped up as a result of construction activities. During operation, any PRoW that have been permanently stopped up may have to be replaced with new pathways. As a result of these changes, it is likely that users of the PRoW will be inconvenienced in having to use other or potentially longer routes on their journeys. However, should any permanent diversions be required, efforts will be made to ensure that the diversions take the shortest feasible route and provide an enhancement from the existing route.

There is also potential that these inconveniences will present a barrier to people using these routes and as such may prevent people walking/cycling/riding horses along pathways they currently use. Barriers to people undertaking travel or exercise should be prevented as they may negatively affect people's physical and mental health and wellbeing.

As noted in LA 112, increases in the length of a PRoW by 250 m – 500 m would create a moderate level of effect on users, with increases over 500 m having a major effect. At this time, it is unknown if any changes to the PRoW will exceed these distances and so there is potential for significant effects relating to disturbance and inconvenience for users of PRoW to occur depending on the sensitivity of the receptor.

6.9.8 Receptors/matters to be scoped into further assessment

LA 112 sets out the following aspects to be covered for land use and accessibility:

- Private property and housing;
- Community land and assets;
- Development land and business;
- Agricultural land holdings; and
- Walkers, cyclists and horse-riders.

Receptor/Matter	Phase	Justification
Walkers, cyclists and horse-riders/PRoW	Construction, operation and decommissioning	There is potential for significant effects to walkers, cyclists and horse riders as a result of temporary and/or permanent diversions of PRoW, which relates to inconvenience and barriers to accessing the existing PRoW.

6.9.9 Receptors/matters to be scoped out of further assessment		
Receptor/Matter	**Phase**	**Justification**
Private property and housing	Construction, operation and decommissioning	There are no properties or houses at risk of demolition as a result of the construction, operation and decommissioning of the Proposed Development. None of the land to be used is allocated for residential development and no new planning applications have been submitted for housing development within the Site boundary. Therefore, there will be no effects to property or housing. As no significant effects are expected in relation to private property and housing, it is proposed that these matters be scoped out of further assessment.
Community land and assets	Construction, operation and decommissioning	LA 112 defines community land as "*common land, village greens, open green space, allotments, sports pitches etc*". The Proposed Development will cover a large area of privately owned agricultural land which is therefore land not used as community land. There are no community assets located within the Site boundary; therefore, no impacts are expected to community land and assets. Impacts to PRoW are discussed above in **Section 6.9.8**. As no significant effects are expected in relation to community land and assets, it is proposed that these matters be scoped out of further assessment.
Agricultural land holdings, development land and businesses	Construction, operation and decommissioning	The nature of the agricultural holdings across the Site boundary varies and there will inevitably be land taken out of agricultural production. There may be businesses/tenants/occupiers currently undertaking agricultural operations across the Site who may cease to do so for the duration or part of the operational phase of the Proposed Development. There are currently eight farming operations in and around the Site, of which all landowners have voluntarily agreed to be a

		part of the Proposed Development with renumeration agreed accordingly. As all landowners are financially involved in the Proposed Development, it is not considered necessary to further assess any impacts to these receptors as a result of the Proposed Development. Beyond such landowners, two tenant farmers will receive separate compensation in lieu of the loss of the ability to farm the aforementioned land. It is therefore understood that the number of farming operations likely to be impacted by the Proposed Development is two, with the number of jobs lost on a semi-permanent basis being two. Therefore, the number of agricultural operations likely to cease as a result of the Proposed Development is low and the subsequent loss of such agricultural employment opportunities is not expected to be significant. As such, it is not proposed to assess impacts to agricultural land holdings or employment further within the EIA. However, a standalone Socio-Economic Statement will be submitted in support of the DCO application which will consider the potential positive and negative socio-economic impacts of the Proposed Development, including the potential loss of agricultural land holdings and permanent employment opportunities in this sector. This report will also consider the potential for cumulative impacts relating to permanent job losses based on other similar projects nearby. Any conclusions in this report will be reflected within the Planning Statement, which will be submitted in support of the DCO application.
Employment	Construction, operation and decommissioning	The construction period is expected to last for 24 months with the number of construction staff as yet unknown. However, it is expected that the construction of the Proposed Development will result in a large number of construction staff being on Site across the construction phase, which is a short term beneficial socio-economic change.

		An increase in the number of people in the area during construction would also likely lead to an increase in the level of spending in the local area though shops and local services and an increase in demand and use of local accommodation. It is proposed that these elements will be considered further within the Socio-Economic Statement, with the relevant conclusions reflected within the Planning Statement. There will be a small number of new jobs created during the operational phase of the Proposed Development, predominantly related to ad-hoc maintenance. However, this is expected to be a small number of job roles and as such is not expected to be significant. There are no other businesses present within the Site boundary. There is no land allocated for employment use, nor are there any planning applications yet to be determined that will generate employment opportunities at the Site. As no significant effects are expected in relation to agricultural land holdings, development land and businesses, it is proposed that these matters be scoped out of the EIA, but will be addressed in the Socio-Economic Statement.

6.9.10 Opportunities for enhancing the environment

Potential enhancement opportunities exist with regards to creating new or enhancing the current condition of PRoW. This may include upgrading access, signage or improving the feel and perception of safety in and around the area.

6.9.11 Proposed assessment methodology

LA 112 includes tables to determine the potential sensitivity of a land use receptor and the magnitude of any impact resulting from changes to PRoW. The length of any likely changes to the PRoW network will be detailed, or if unknown, worst case distances will be assumed. The aforementioned sensitivity and magnitude criteria will be used as the basis of assessing the potential for significant effects after design and mitigation measures have been taken into account. Further detail on the significance criteria that will be applied is presented in **Appendix D**.

A standalone Socio-Economic Statement will be prepared and submitted in support of the DCO application. This report will consider the potential positive and negative socio-economic impacts of the Proposed Development but as none of these elements are

expected to be significant, it is proposed this assessment can be undertaken outside of the EIA process.

Any conclusions from the Socio-Economic Statement report will be reflected within the Planning Statement, to be submitted in support of the DCO application. This Socio-Economic Statement will cover:

- The potential loss of agricultural land holdings and permanent jobs in the agricultural sector which will be a long term negative change;
- The small number of new jobs likely to be created during the operational phase of the Proposed Development through the need to maintain the ongoing operation which will be a long term positive change;
- The potential for job opportunities through the construction period; and
- The potential increase in the number of people in the area during construction and how that is to likely lead to an increase in the level of spending in the local area though shops and local services and an increase in demand and use of local accommodation, which may be a short term and/or long term positive or negative change.

6.9.12 Difficulties and uncertainties

To ensure transparency within the EIA process, the following difficulties and uncertainties have been identified.

- As the Proposed Development is still in the design phase and does not have a fixed layout, it is not possible to determine the exact length or number of any planned changes to PRoW at this stage. However, this information will be determined to inform the ES and the DCO application.

6.9.13 References

- Design Manual for Roads and Bridges (2020), LA 112 - Population and human health'. Available at: https://www.standardsforhighways.co.uk/search/1e13d6ac-755e-4d60-9735-f976bf64580a

6.9.14 Scoping questions

- Do you agree with the proposed study areas?
- Do you agree that the data sources listed to inform the EIA baseline characterisation are appropriate?
- Are any receptors/assets/resources not identified that you would like to see included in the EIA?
- Do you agree with the proposed additional (secondary and tertiary) mitigation measures and is this mitigation appropriate?
- Do you agree with the receptors/matters that are proposed to be scoped in and out of the EIA?
- Do you agree with the proposed factor-specific assessment approach?

7 CUMULATIVE EFFECTS

7.1 Proposed assessment methodology

7.1.1 Schedule 4 paragraph (5)(e) of the EIA Regulations states that the ES should include *"a description of the likely significant effects of the development on the environment resulting from… the cumulation of effects with other existing and/or approved projects, taking into account any existing environmental problems relating to areas of particular environmental importance likely to be affected or the use of natural resources"*.

7.1.2 Regulation 5(2) states that the EIA must identify, describe and assess in an appropriate manner, in light of each individual case, the direct and indirect significant effects of the proposed development on the following factors: population and human health; biodiversity, land; soil; water; air and climate; material assets; cultural heritage; and the landscape. Regulation 5(2)(e) refers to the need to assess *"the interaction between [those] factors"*.

7.1.3 Cumulative effects occur as a result of several actions on an environmental receptor which may overlap or act in combination. The following types of cumulative effects will be considered in accordance with the EIA Regulations and best practice guidance:

- **Intra-project combined effects** – the interaction and combination of different environmental residual (post-additional mitigation) effects from within the Proposed Development affecting a receptor; and
- **Inter-project cumulative effects** – the combined residual (post-additional mitigation) effects of the Proposed Development and another project or projects on a single receptor/resource.

7.1.4 There is no widely accepted methodology for assessing cumulative effects, although various best practice and guidance documents exist. However, relevant guidance has been considered, including from the Institute of Environmental Management and Assessment (IEMA). and the assessment guidance set out in the Planning Inspectorate's Advice Note Seventeen: Cumulative Effects Assessment on inter-project cumulative effects.

7.1.5 The following approach will be adopted for the assessment of cumulative effects, based on previous experience, the types of receptors being assessed, the nature of the Proposed Development, the other developments under consideration and the information available to inform the assessment.

Intra-project combined effects

7.1.6 The approach to the assessment of interactions of environmental effects (intra-project combined effects) will consider the changes in baseline conditions at common sensitive receptors (i.e., those receptors that have been identified as experiencing likely significant environmental effects by more than

one environmental factor) due to the Proposed Development. The assessment will be based upon residual (post-additional mitigation) effects of 'slight/minor' or greater significance only ('negligible' residual effects will not be considered). The assessment will also include consideration of where multiple non-significant effects could combine to become significant. The study area for the assessment of intra-project combined effects will be informed by the study areas for the individual environmental factor assessments.

7.1.7 The assessment of the intra-project combined effects will be undertaken using a two-stage approach:

Stage 1 – Screening

7.1.8 Screening will be undertaken to determine whether a sensitive receptor is exposed to more than one type of residual (post-additional mitigation) effect during the construction, operation and decommissioning phases of the Proposed Development. Those common sensitive receptors exposed to two or more types of residual (post-additional mitigation) effects, with significance of 'slight/minor' or greater, will be taken forward to Stage 2 of the assessment.

7.1.9 If there is only one type of effect on a sensitive receptor (i.e., only one environmental factor assessment chapter has identified effects on that sensitive receptor), then it will be considered that there are no potential intra-project combined effects and the sensitive receptor will not be taken forward to Stage 2 of the assessment.

Stage 2 – Assessment of intra-project combine effects

7.1.10 A quantitative assessment of the overall significance of the cumulative effects on common sensitive receptors identified at Stage 1 will be undertaken, based on technical information provided in the environmental factor assessment chapters and supporting appendices, as well as professional judgement. Given that the types of effects may be very different in some cases, a quantitative assessment may not be possible, and it may be necessary to apply professional judgement in determining the significance of each individual effect.

7.1.11 The evaluation at the receptor level will consider: the magnitude of change at the common receptor; previously identified sensitivity; duration and reversibility of interaction. The focus will be on determining a change in the level of effect likely to be experienced and whether this is significant or not.

Inter-project cumulative effects

7.1.12 The approach to the assessment of inter-project effects will consider the deviation from the baseline conditions at common sensitive receptors as a result of changes brought about as a result of the Proposed Development in combination with one or more other existing development and/or approved

development(s). The assessment of the inter-project effects will be based upon the residual (post-additional mitigation) effects that have been identified in the various environmental factor assessments for the Proposed Development, as well as available environmental information for the other existing development and/or approved developments.

7.1.13 In accordance with the Planning Inspectorate's Advice Note Seventeen, the identification of other existing development and/or approved developments will comprise two clear stages, as follows:

- **Stage 1**: establish a long list of other existing development and/or approved developments based on appropriate spatial and temporal limits.
- **Stage 2**: apply a clear rationale to establish a short list of other existing development and/or approved developments which, in combination with the Proposed Development, have the potential to result in a significant cumulative effect for inclusion within the assessment.

Stage 1: Long list methodology

7.1.14 In accordance with the Planning Inspectorate's Advice Note Seventeen, the first task in establishing the long list of relevant 'other existing development and/or approved development(s)' is to determine the 'search area'. The 'search area' will be determined by affording consideration to the Zone of Influence (ZoI) for each environmental factor assessed.

7.1.15 The ZoI for each environmental factor is defined as the spatial area over which an effect is likely to be experienced. The ZoI for each environmental factor will be identified based on the extent of the likely effects as identified as the study area in each of the individual environmental factor assessments, whilst also reflecting any additional area over which cumulative effects may occur for particular cumulative scenarios (e.g. sequential cumulative visual effects on users of linear routes).

7.1.16 The overall combined 'search area' for the long list of relevant 'other existing development and/or approved development(s)' will be based on the largest ZoI in terms of distance.

7.1.17 Following the adoption of the ZoI, a planning application search will be undertaken to identify other existing development and/or approved developments within the ZoI, using the planning portals of East Riding of Yorkshire Council and the Planning Inspectorate. However, it is recognised that East Riding of Yorkshire Council, as the local planning authority, may be aware of additional proposals not yet fully in the public domain and hence comment is sought on any further developments that should, in the authority's opinion, be included in the cumulative effects assessment process.

7.1.18 Only the following types of other existing developments and/or approved developments will be considered for inclusion on the long list, as the Applicant

considers that any development that does not fall within these types would not likely give rise to a significant cumulative effect:

- Employment developments;
- Residential developments of 10+ dwellings;
- Minerals and waste applications;
- NSIP developments[4];
- Transport infrastructure developments (trunk roads or motorways only); and
- Energy infrastructure developments.

7.1.19 Furthermore, of the development types listed above, only those that meet one or more of the following criteria will be included on the long list (in accordance with the 'Tier 1' and 'Tier 2' descriptions in Table 2 of the Planning Inspectorate's Advice Note Seventeen):

- Projects that are under construction but that will not be completed prior to the Proposed Development commencing (N.B. in accordance with Table 2 of the Planning Inspectorate's Advice Note Seventeen, other projects that are expected to be completed before construction of the Proposed Development, and the effects of those projects have been fully determined within their respective applications, are considered as part of the baseline);
- Projects with planning permission within the last five years[5] (whether under the Planning Act 2008 or other regimes), but not yet implemented;
- Submitted applications (whether under the Planning Act 2008 or other regimes), but not yet determined;
- Projects on the Planning Inspectorate's Programme of Projects where an EIA Scoping Report has been submitted, but for which an application has not yet been submitted.

7.1.20 The Applicant's interpretation of last bullet point above is that this solely relates to NSIPs. However, the Applicant will widen this particular criteria to include projects screened as EIA development under other regimes where an EIA Scoping Report has been submitted, but for which an application has not yet been submitted.

7.1.21 It should be noted that with reference to 'Tier 3' descriptions in Table 2 of the Planning Inspectorate's Advice Note Seventeen, the following other existing development and/or approved development(s) will not be considered for inclusion in the long list, as none of the below will have sufficient environmental assessment information freely and publicly available to inform the inter-project

[4] As defined by the Planning Act 2008 (as amended)

[5] A five-year period is considered a reasonable time period to capture all other existing development and/or approved developments that still have the potential to be built. Developments with planning permission older than five years will likely have been built or will not likely be built at all.

cumulative effects assessment, nor is there sufficient certainty on their delivery, nor are any of the below considered by the Applicant to be 'existing development and/or approved development':

- Projects on the Planning Inspectorate's Programme of Projects where an EIA Scoping Report has not been submitted;
- Projects that have been identified in the relevant Development Plan(s) (and emerging Development Plans); and
- Projects identified in other plans and programmes (as appropriate) which set the framework for future development consents/approvals, where such development is reasonably likely to come forward.

7.1.22 Only if the other existing development and/or approved developments meet the Stage 1 criteria will they then been taken forward to Stage 2. The long list will be kept under review, with the intention of agreeing the long list with East Riding of Yorkshire Council prior to the completion of the ES to allow for a robust assessment of cumulative effects.

Stage 2: Short list methodology

7.1.23 Following the formation of the long list, the eligible other existing development and/or approved developments identified require further assessment (Stage 2) to establish a short list of other existing development and/or approved developments which, in combination with the Proposed Development, have the potential to result in significant cumulative effects.

7.1.24 The criteria used to determine whether to include or exclude an existing development and/or approved development on the short list will reflect the process established by the Planning Inspectorate's Advice Note Seventeen and have regard to relevant policy and guidance documents and consultation with the appropriate statutory consultation bodies (particularly East Riding of Yorkshire Council). The Planning Inspectorate's Advice Note Seventeen states that the criteria should address the following:

- *"**Temporal scope:** The applicant may wish to consider the relative construction, operation and decommissioning programmes of the 'other existing development and/or approved development' identified in the ZoI together with the NSIP programme, to establish whether there is overlap and any potential for interaction.*
- ***Scale and nature of development:** The applicant may wish to consider whether the scale and nature of the 'other existing development and/or approved development' identified in the ZoI are likely to interact with the proposed NSIP. Statutory definitions of major development and EIA screening thresholds may be of assistance when considering issues of scale.*
- ***Other factors:** The applicant should consider whether there are any other factors, such as the nature and/or capacity of the receiving environment that would make a significant cumulative effect with 'other existing development and/or approved development' more or less likely*

and may consider utilising a source-pathway-receptor approach to inform the assessment.

- ***Documentation:*** *The CEA shortlisting process may be documented using Matrix 1 (Appendix 1). The reasons for excluding any development from further consideration should be clearly recorded. This will provide decision makers, consultation bodies and members of the public with a clear record of 'other existing development and/or approved development' considered and the applicant's decision making process with respect to the need for further assessment."*

7.1.25 The Planning Inspectorate's Advice Note Seventeen suggests that professional judgement may also be used to supplement the threshold criteria and in order to avoid excluding 'other existing development and/or approved development' that is:

- *"Below the threshold criteria limits but has characteristics likely to give rise to a significant effect; or*
- *Below the threshold criteria limits but could give rise to a cumulative effect by virtue of its proximity to the proposed NSIP* [i.e. the Proposed Development]*."*

7.1.26 The Planning Inspectorate's Advice Note Seventeen also notes *"Similarly, professional judgement could be applied to support excluding 'other existing development and/or approved development' that exceeds the thresholds but may not give rise to discernible effects. All of the 'other existing development and/or approved development' considered should be documented and the reasons for inclusion or exclusion should be clearly stated*."

7.1.27 Taking the above into consideration, the other existing development and/or approved developments on the long list will be reviewed against the following criteria to form the short list of other existing development and/or approved developments:

- **Criteria 1**: The other existing development and/or approved development has a construction, operational and/or decommissioning phase that is concurrent with any phase of the Proposed Development.
- **Criteria 2**: The other existing development and/or approved development and the Proposed Development share common sensitive receptors/resources which are assessed and described in the supporting environmental documentation and have the potential to be significantly affected by the combination of the other existing development and/or approved development and the Proposed Development.
- **Criteria 3**: The other existing development and/or approved development has sufficient environmental assessment information freely and publicly available to inform the inter-project cumulative effects assessment. The assessment of each existing development and/or approved development on the short list will be proportionate to the environmental assessment information available (N.B: An attempt

will not be made to assess the potential environmental effects of any other development to inform the inter-project cumulative effects assessment. If there is an existing development and/or approved development that it is known will be progressed but has insufficient environmental assessment information, it still may be prudent to consider it in the inter-project cumulative effects assessment. This might take the form of listing the project and why it hasn't been considered in detail, or the potential cumulative effect could be discussed at a high level (qualitatively) using professional judgement).

7.1.28 Where an existing development and/or approved development meets all of the above criteria, it will be included on the 'short list' and will be taken forward for further consideration in the assessment. The short list will be kept under review, with the intention of agreeing the short list with East Riding of Yorkshire Council prior to the completion of the ES to allow for a robust assessment of cumulative effects.

7.1.29 Where developments are discounted from the short list, they will continue to be monitored to ensure that any changes to those projects are identified and their omission from the short list is reassessed prior to undertaking the cumulative assessment for the ES.

Stage 3: Information gathering

7.1.30 The other existing development and/or approved developments that form part of the short list will be subject to a review of environmental information, where available, including details of:

- Location;
- Programme, including construction, operation and decommissioning;
- Baseline data;
- Effects arising from such other developments; and
- Proposed design.

Stage 4: Assessment

7.1.31 There is no formal guidance on the criteria for determining significance of cumulative effects. The following principles will be considered when assessing the significance of inter-project effects, in accordance with the Planning Inspectorate's Advice Note Seventeen and in consideration of any mitigation measures required to avoid, prevent, reduce or, if possible, offset any identified significant adverse cumulative effects:

- Is there an inter-project effect on any receptors/resources;
- The duration and frequency of the effects;
- The nature of the receptors/resources affected;
- How the potential impacts identified combine to affect the condition of the receptor/resource;

- The probabilities of the impacts occurring in relation to each other in such a way so as to produce a cumulative effect, considering the extent and duration of the impact change;
- The ability of the receptor/resource to absorb further impacts; and
- Is the level of effect different to that considered at the project level and is the cumulative effect significant or not.

7.2 Difficulties and uncertainties

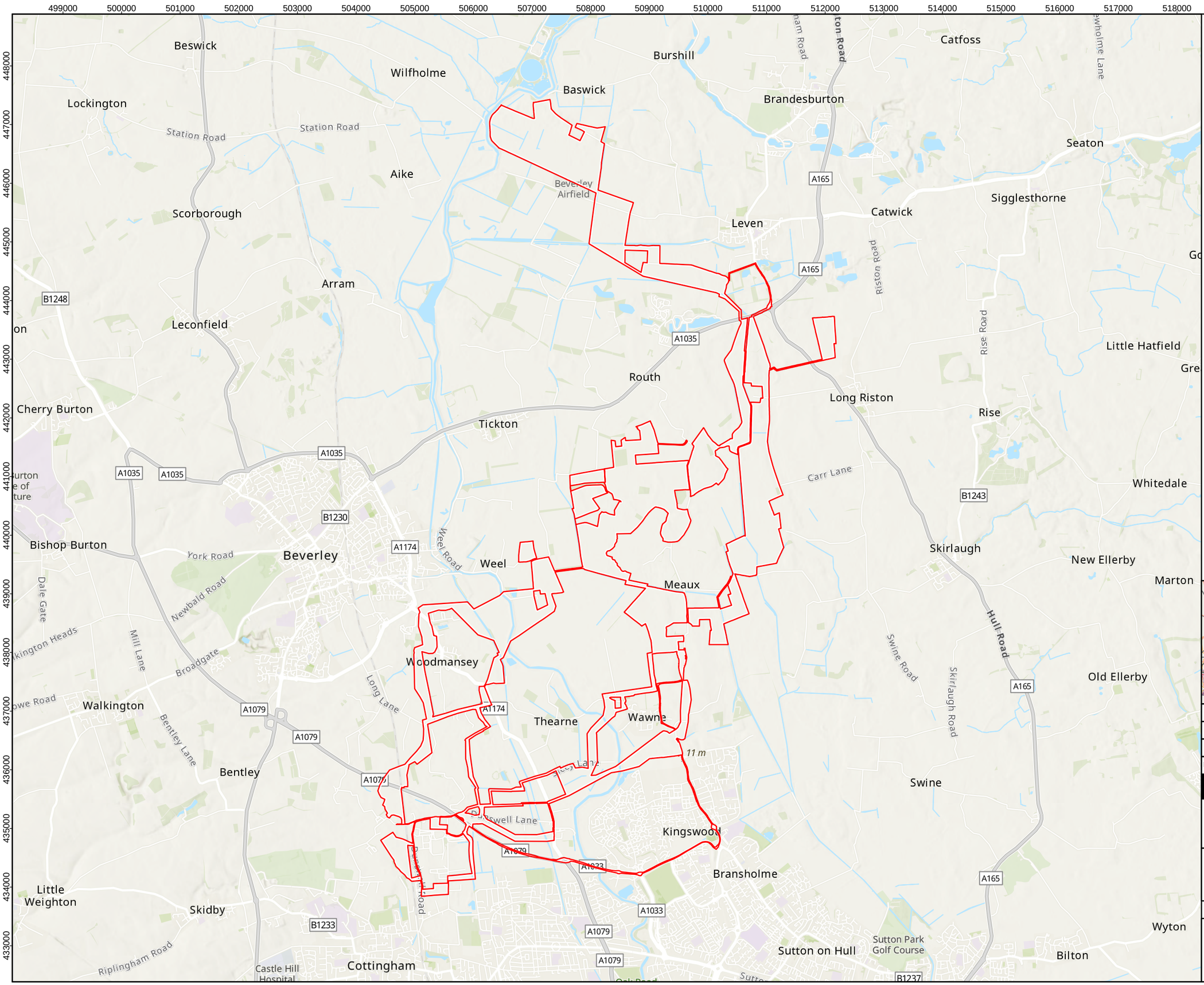
7.2.1 The assessment of inter-project cumulative effects will be limited to publicly available information obtained from the relevant planning applications on the planning portals of East Riding of Yorkshire Council and the Planning Inspectorate. For some of the identified other existing development and/or approved developments, relevant information for this assessment may not be available. Where this is the case, the inter-project cumulative effects assessment will be based upon assumptions and professional judgement, reliant on the review of mitigation measures proposed as part of the other existing development and/or approved developments rather than the Proposed Development.

7.3 References

Institute of Environmental Management and Assessment (IEMA) (2011) 'The State of Environmental Impact Assessment in the UK'. Available at: https://s3.eu-west-2.amazonaws.com/iema.net/documents/knowledge/policy/impact-assessment/2011-State-of-EIA-IEMA.pdf

Planning Inspectorate (August 2019) Advice Note Seventeen: Cumulative effects assessment relevant to nationally significant infrastructure projects' (Version 2). Available online https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/

APPENDIX A
PROPOSED DEVELOPMENT LOCATION



Legend:

- Site Boundary

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	08/11/2023	Finalising	FA	MM	AB
00	20/10/2023	First Draft	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix A:
Proposed Development Location

ID:AppendixA_ProposedDevLocation_A3L

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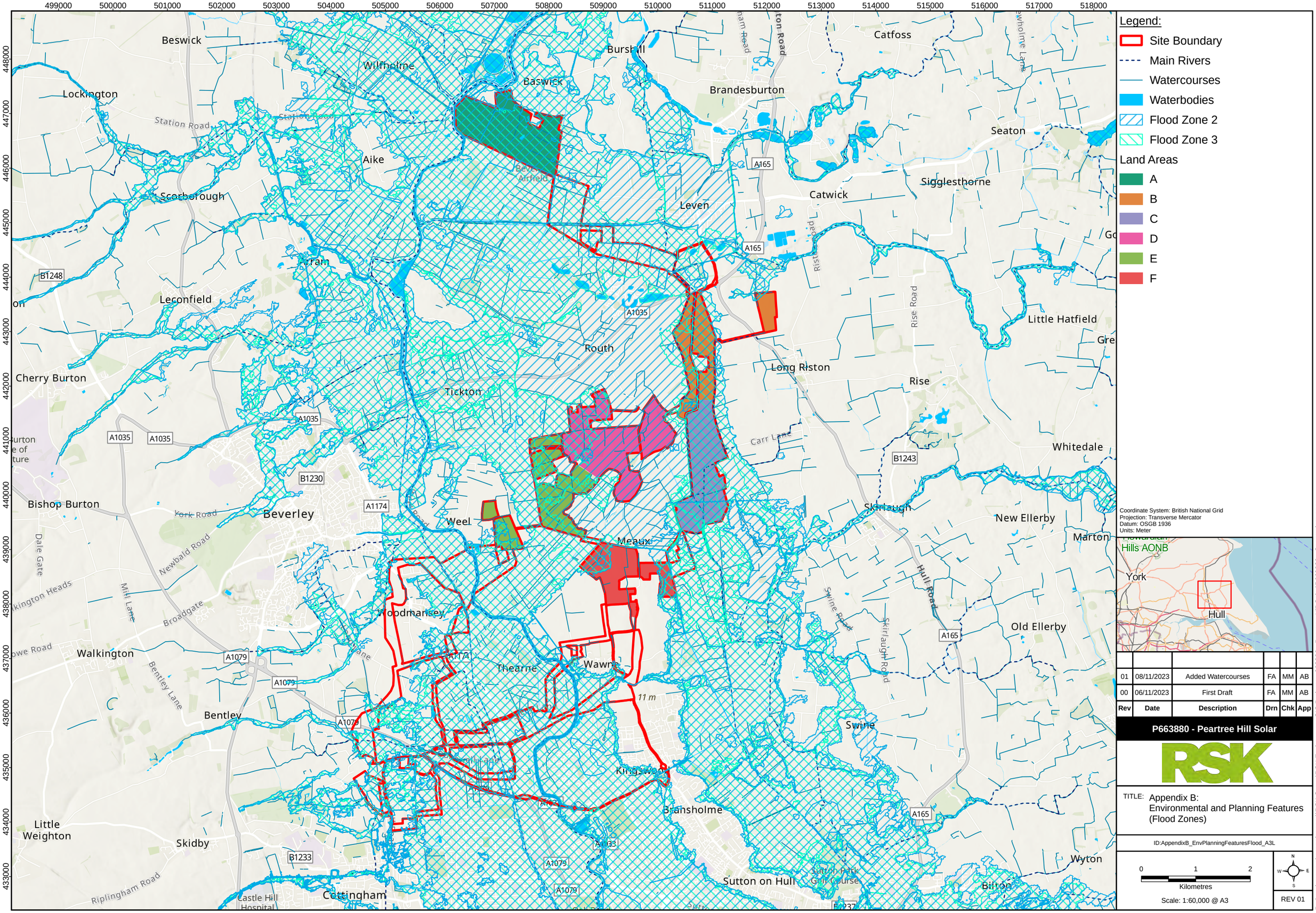
APPENDIX B
ENVIRONMENTAL AND PLANNING FEATURES



Legend:

- Site Boundary
- Main Rivers
- Watercourses
- Waterbodies
- Flood Zone 2
- Flood Zone 3

Land Areas

- A
- B
- C
- D
- E
- F

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
01	08/11/2023	Added Watercourses	FA	MM	AB
00	06/11/2023	First Draft	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B:
Environmental and Planning Features
(Flood Zones)

ID:AppendixB_EnvPlanningFeaturesFlood_A3L

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Kilometres
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REV 01

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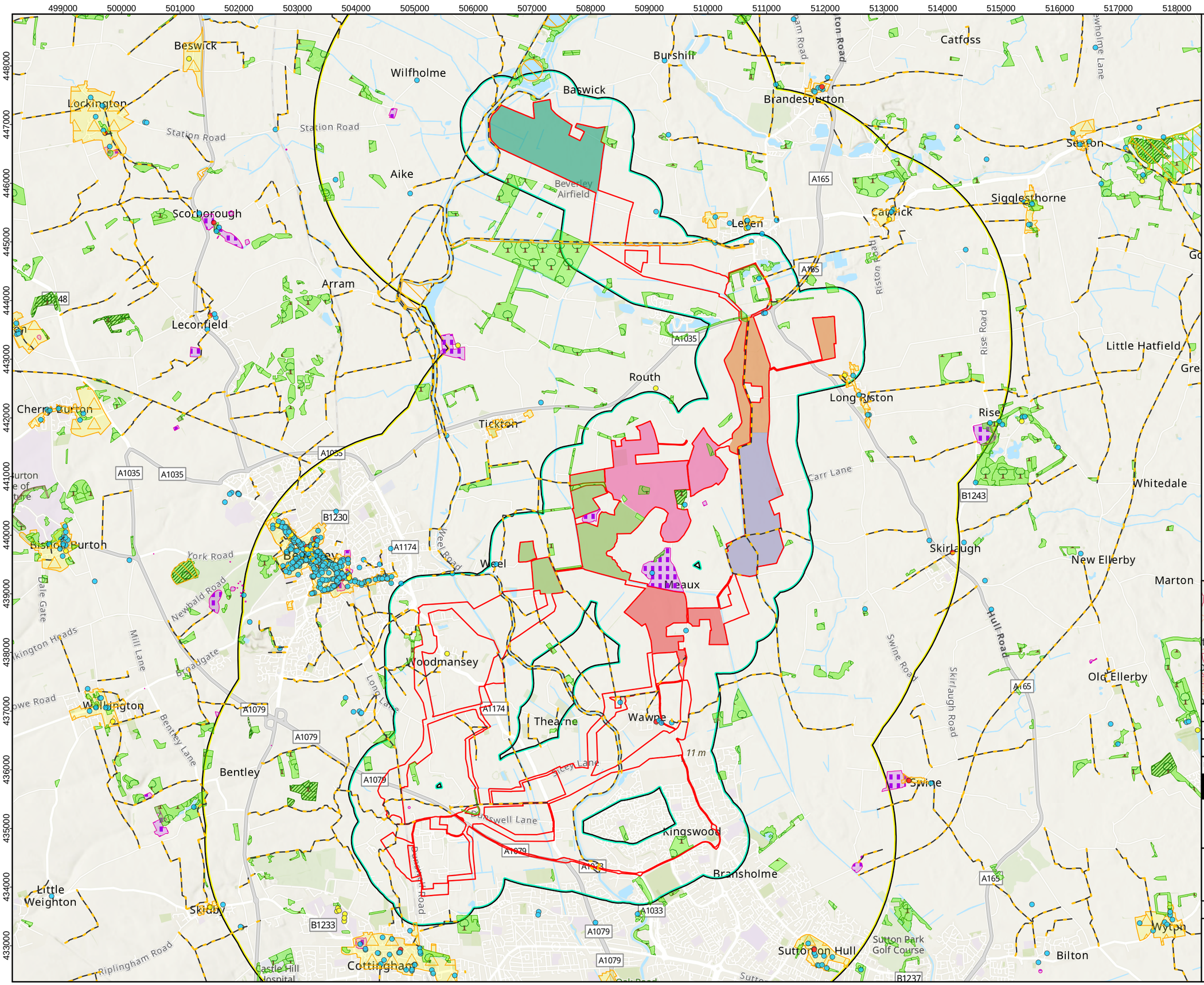

Legend:

- Site Boundary
- 500 m buffer
- 3 km buffer

Listed Building

- I
- II
- II*

- Public Rights of Way (indicative)
- SSSI
- SPA
- Ancient Woodland
- Woodland
- Conservation_Areas
- Scheduled Monuments

Land Areas

- A
- B
- C
- D
- E
- F

NOTES: Flood zones shown on sheet 1

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
03	08/11/2023	Added & Updated Constraints	FA	MM	AB
02	06/11/2023	Solar Area Boundaries	FA	MM	AB
01	27/10/2023	Added constraints	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B:
Environmental and Planning Features

ID:AppendixB_EnvPlanningFeatures_A3L

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REV 03

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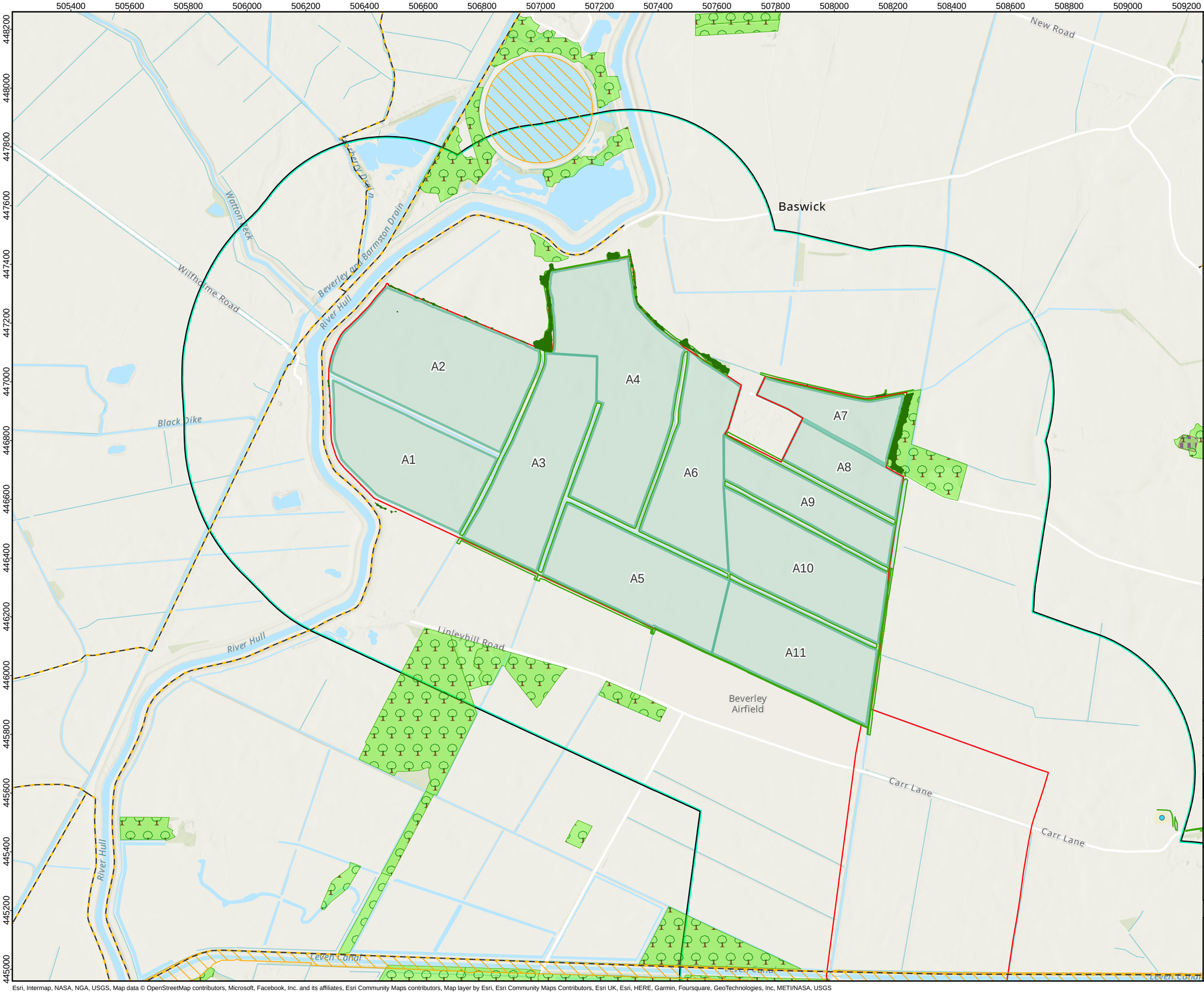

Legend:

- Site Boundary
- 500 m buffer
- 3 km buffer

Listed Building

- II

- Public Rights of Way (indicative)
- Hedges
- Trees
- SSSI
- Woodland
- Scheduled Monuments

Land Area Fields

- A

NOTES: Flood zones shown on sheet 1

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
03	08/11/2023	Added & Updated Constraints	FA	MM	AB
02	06/11/2023	Solar Area Boundaries	FA	MM	AB
01	27/10/2023	Added constraints	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B:
Environmental and Planning Features
Land Area: A

ID:AppendixB_EnvPlanningFeatures_A3L_atlas

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Kilometres

Scale: 1:12,000 @ A3

REV 03

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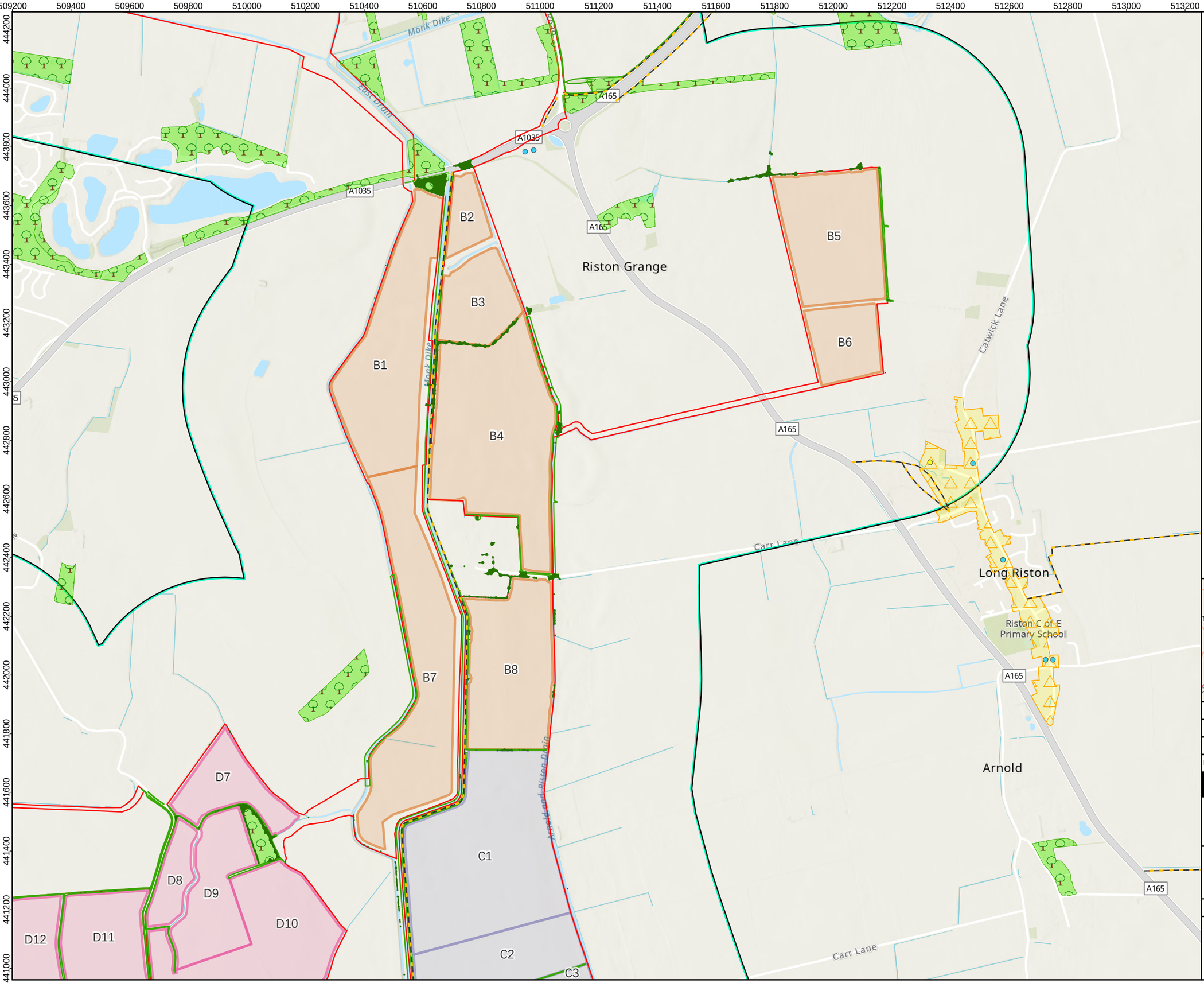

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Legend:

- Site Boundary
- 500 m buffer
- 3 km buffer

Listed Building

- II
- II*

- Public Rights of Way (indicative)
- Hedges
- Trees
- Woodland
- Conservation_Areas

Land Area Fields

- B
- C
- D

NOTES: Flood zones shown on sheet 1

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
03	08/11/2023	Added & Updated Constraints	FA	MM	AB
02	06/11/2023	Solar Area Boundaries	FA	MM	AB
01	27/10/2023	Added constraints	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B:
Environmental and Planning Features
Land Area: B

ID:AppendixB_EnvPlanningFeatures_A3L_atlas

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Kilometres

Scale: 1:12,000 @ A3

REV 03

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442000 441800 441600 441400 441200 441000 440800 440600 440400 440200 440000 439800 439600 439400 439200 439000

B8 B7 C1 C2 C3 C4 C5 C6 C8 C9 C7

D4 D6 D5 D3 D7 D8 D9 D10 D11 D12 D13 D15 D17 D16 E8 D18

F1 F3 F4 F5 F6

Riston C of E Primary School

A165

Arnold

Carr Lane

Black Tup Lane

Woodhouse Lane

Ings Lane

Kidhill Lane

Meaux Lane

Meaux

Swine Ro

Arnold Land Riston Drain

Mark Dike

Legend:

- Site Boundary
- 500 m buffer
- 3 km buffer

Listed Building

- II

- Public Rights of Way (indicative)
- Hedges
- Trees
- Woodland
- Ancient Woodland
- Conservation_Areas
- Scheduled Monuments

Land Area Fields

- B
- C
- D
- E
- F

NOTES: Flood zones shown on sheet 1

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
03	08/11/2023	Added & Updated Constraints	FA	MM	AB
02	06/11/2023	Solar Area Boundaries	FA	MM	AB
01	27/10/2023	Added constraints	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B:
Environmental and Planning Features
Land Area: C

ID:AppendixB_EnvPlanningFeatures_A3L_atlas

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Kilometres

Scale: 1:12,000 @ A3

REV 03

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442400 442200 442000 441800 441600 441400 441200 441000 440800 440600 440400 440200 440000 439800 439600 439400

Meaux Lane
A1035
Hornsea Road
Wassand Grange Lane
Kidhill Lane
Public Right of Way (indicative)

B4 B7 B8 C1 C2 C3 C4 C5 C6 C7 C8 C9

D1 D2 D3 D4 D5 D6 D7 D8 D9 D10 D11 D12 D13 D14 D15 D16 D17 D18

E1 E2 E3 E4 E5 E6 E7 E8 E9 E10 E11 E12 E15 E16 E17

Legend:

- Site Boundary
- 500 m buffer
- 3 km buffer

Listed Building

- II
- II*

- Public Rights of Way (indicative)
- Hedges
- Trees
- Woodland
- Ancient Woodland
- Scheduled Monuments

Land Area Fields

- B
- C
- D
- E

NOTES: Flood zones shown on sheet 1

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
03	08/11/2023	Added & Updated Constraints	FA	MM	AB
02	06/11/2023	Solar Area Boundaries	FA	MM	AB
01	27/10/2023	Added constraints	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B:
Environmental and Planning Features
Land Area: D

ID:AppendixB_EnvPlanningFeatures_A3L_atlas

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Kilometres

Scale: 1:12,000 @ A3

REV 03

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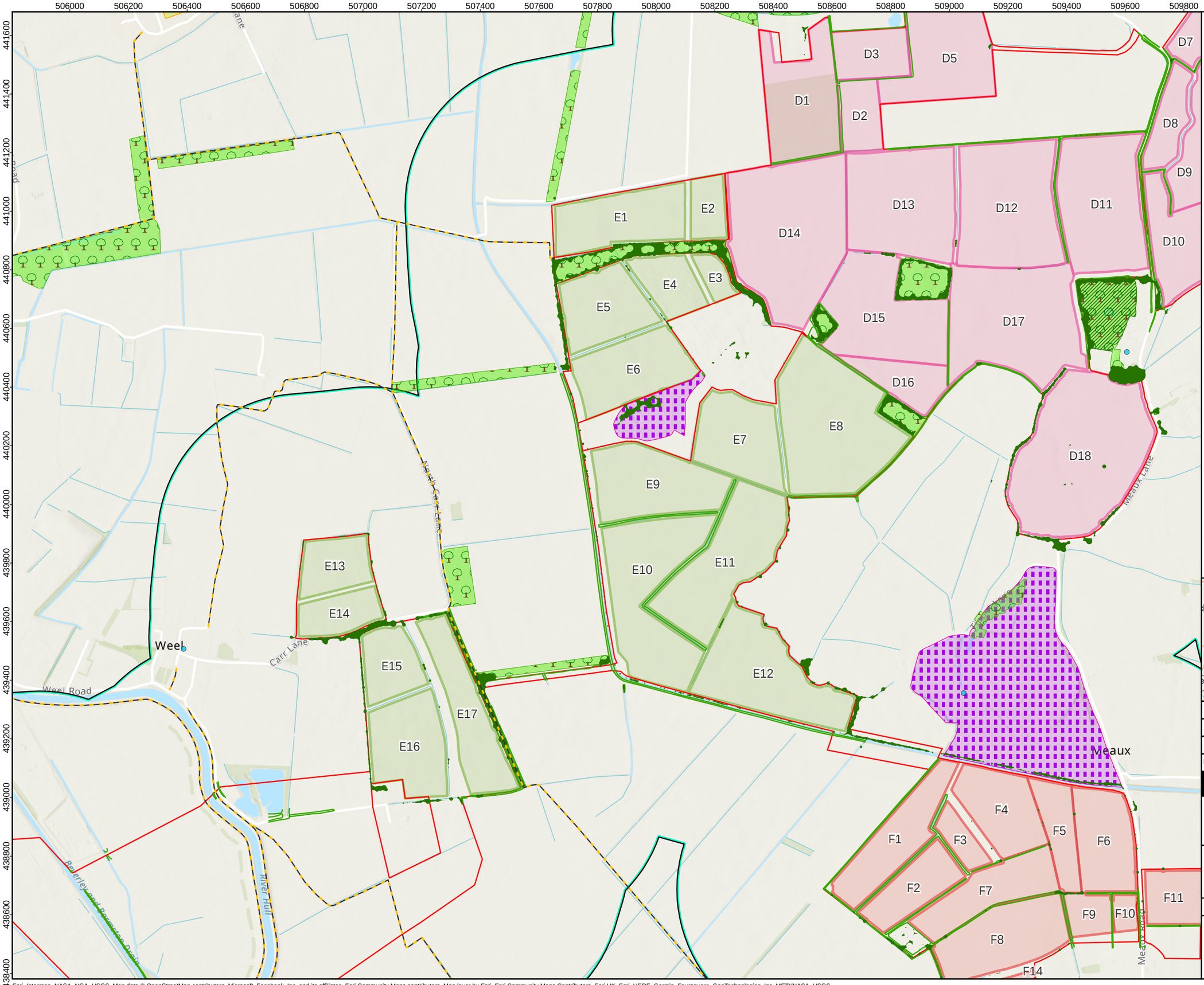

Legend:

- Site Boundary
- 500 m buffer
- 3 km buffer

Listed Building
- II

- Public Rights of Way (indicative)
- Hedges
- Trees
- Woodland
- Ancient Woodland
- Conservation_Areas
- Scheduled Monuments

Land Area Fields
- D
- E
- F

NOTES: Flood zones shown on sheet 1

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
03	08/11/2023	Added & Updated Constraints	FA	MM	AB
02	06/11/2023	Solar Area Boundaries	FA	MM	AB
01	27/10/2023	Added constraints	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B:
Environmental and Planning Features
Land Area: E

ID:AppendixB_EnvPlanningFeatures_A3L_atlas

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Kilometres

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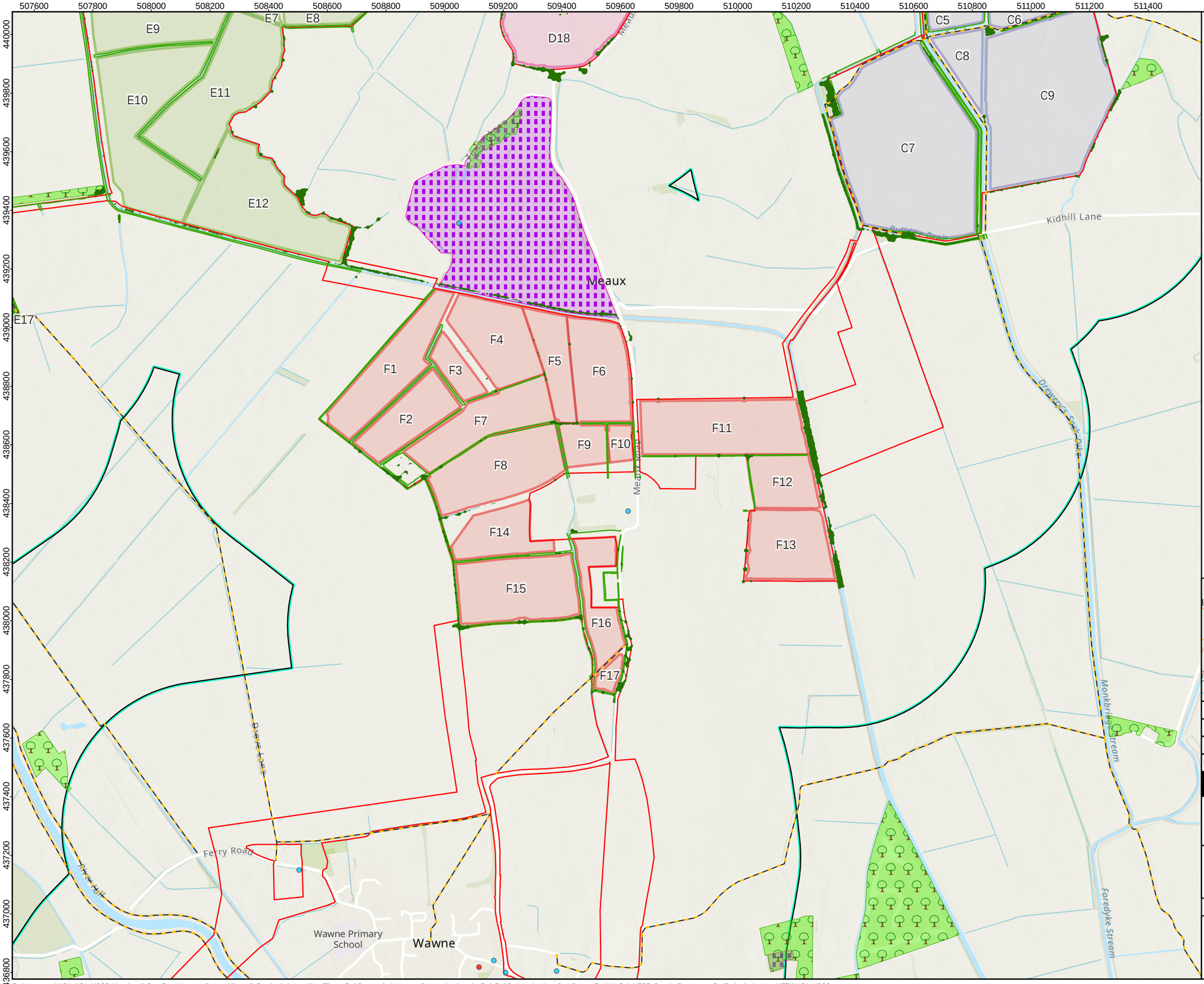

Legend:

- Site Boundary
- 500 m buffer
- 3 km buffer

Listed Building

- I
- II

- Public Rights of Way (indicative)
- Hedges
- Trees
- Woodland
- Scheduled Monuments

Land Area Fields

- C
- D
- E
- F

NOTES: Flood zones shown on sheet 1

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
03	08/11/2023	Added & Updated Constraints	FA	MM	AB
02	06/11/2023	Solar Area Boundaries	FA	MM	AB
01	27/10/2023	Added constraints	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B:
Environmental and Planning Features
Land Area: F

ID:AppendixB_EnvPlanningFeatures_A3L_atlas

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Kilometres

Scale: 1:12,000 @ A3

REV 03

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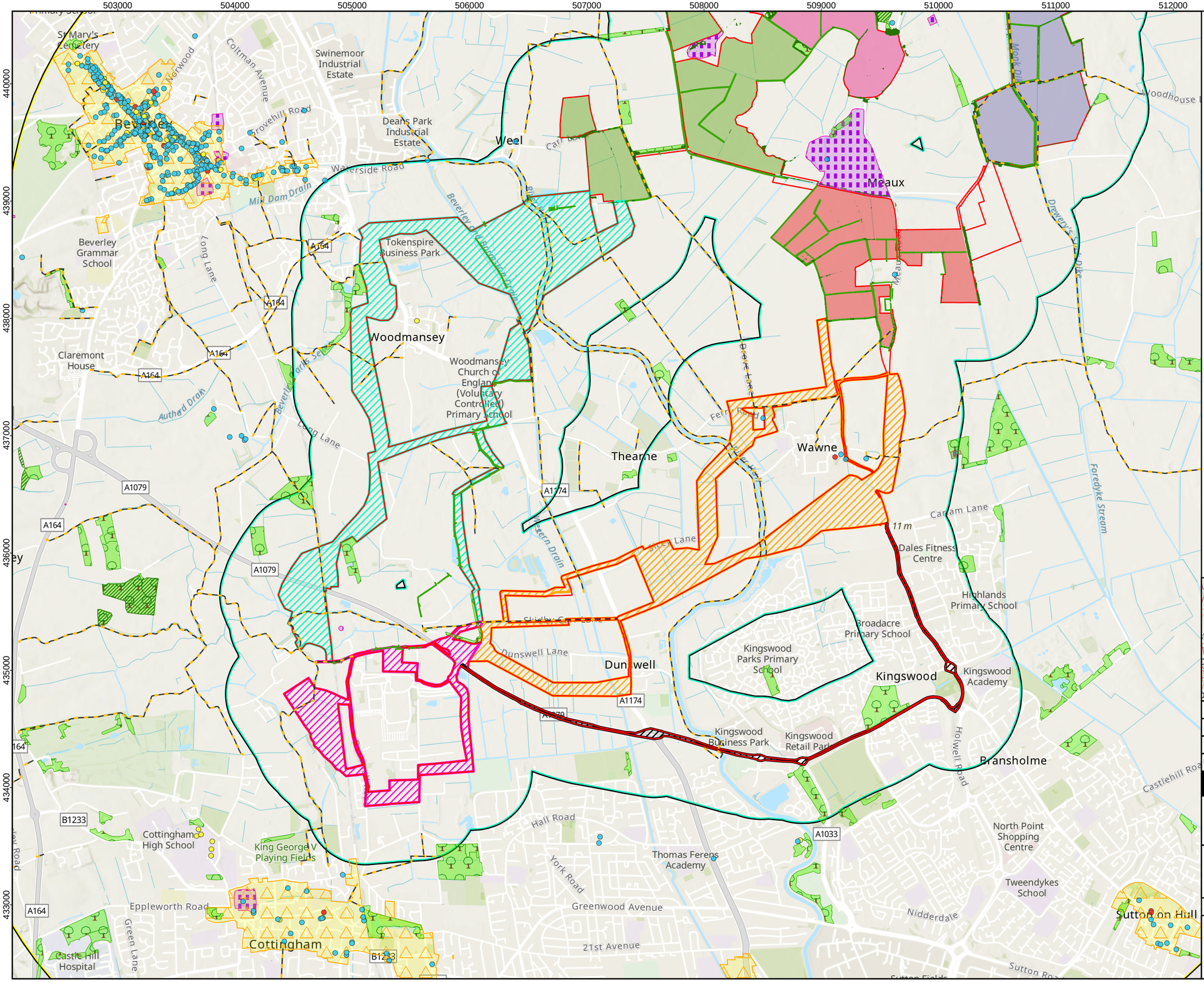

Legend:

- Site Boundary
- 500 m buffer
- 3 km buffer

Listed Building

- I
- II
- II*

- Public Rights of Way (indicative)
- Hedges
- Trees
- Ancient Woodland
- Woodland
- Conservation_Areas
- Scheduled Monuments

Proposed Cable Route Options

- Western land option
- Highways option
- Eastern land option
- Mixed Option

Land Areas

- C
- D
- E
- F

NOTES: Flood zones shown on sheet 1

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
03	08/11/2023	Added & Updated Constraints	FA	MM	AB
02	06/11/2023	Solar Area Boundaries	FA	MM	AB
01	27/10/2023	Added constraints	FA	MM	AB

P663880 - Peartree Hill Solar

TITLE: Appendix B: Environmental and Planning Features (Proposed Cable Route Options)

ID:AppendixB_EnvPlanningFeaturesCable_A3L

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Kilometres

Scale: 1:30,000 @ A3

REV 03

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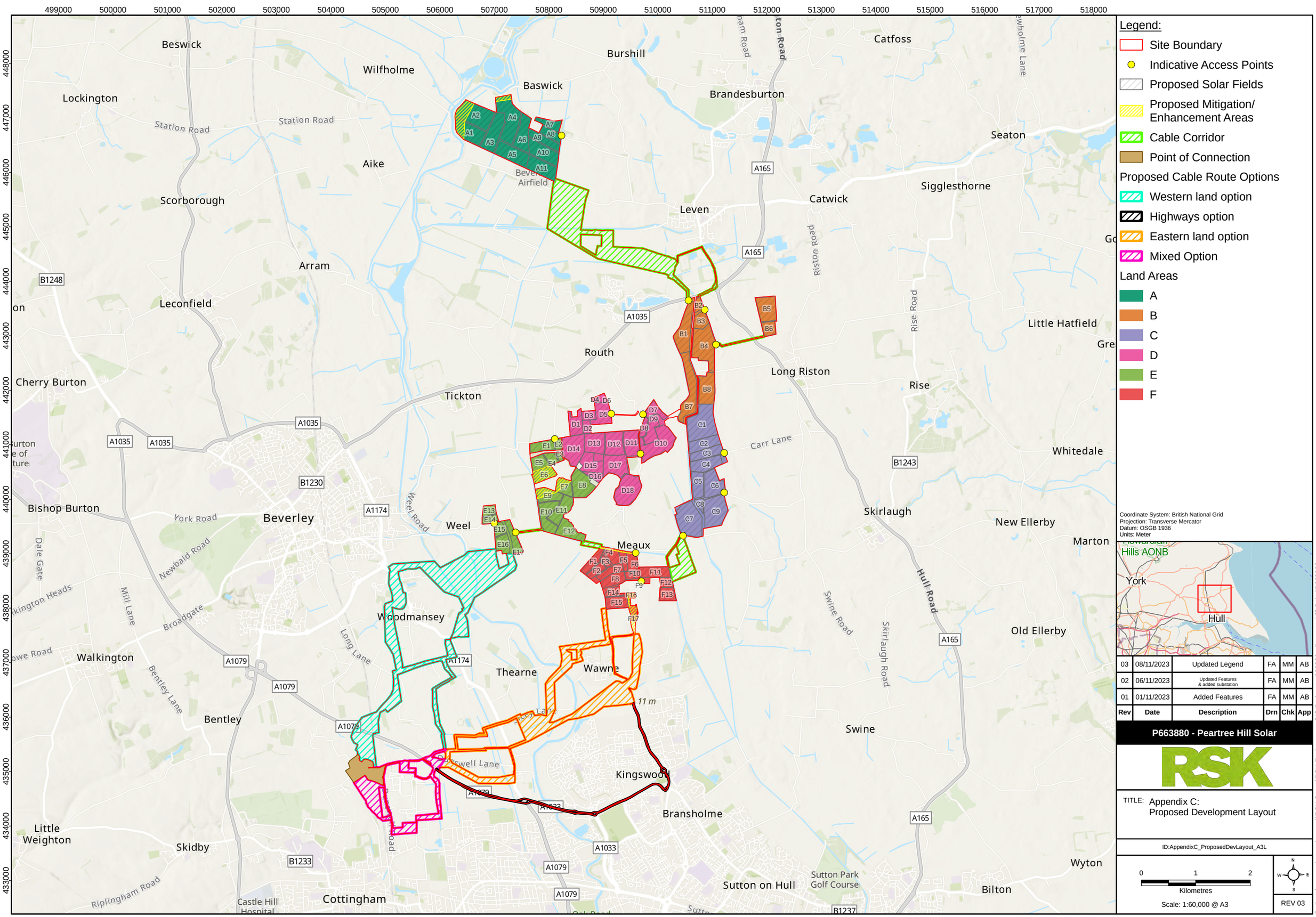
APPENDIX C
PROPOSED DEVELOPMENT LAYOUT



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APPENDIX D
SIGNIFICANCE CRITERIA

Air Quality

The significance level attributed to each effect will be assessed based on the magnitude of change due to the Proposed Development and the sensitivity of the affected receptor.

Construction and decommissioning phase: dust and particulate matter emissions impact

The Institute of Air Quality Management (IAQM) 'Guidance on the Assessment of Dust from Demolition and Construction, V2.1' (2023) criteria and methodology will be adopted to determine the sensitivity of the receptor and the magnitude of change.

Table D1 below sets out the general principles as set out in IAQM Guidance (2023), along with professional judgement, that will be considered to determine the scale of sensitivity that will be applied to receptors identified and considered within the construction and decommissioning phase assessments.

Table D1: Construction and decommissioning phase assessments – scale of receptor sensitivity

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
High	Users can reasonably expect an enjoyment of a high level of amenity. The appearance, aesthetics or value of their property would be diminished by soiling. The people or property would reasonably be expected to be present continuously, or at least regularly for extended periods, as part of the normal pattern of use of the land.	Locations where members of the public are exposed over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Examples include residential properties, hospitals, schools and residential care homes should also be considered as	Locations with an international or national designation and the designated features may be affected by dust soiling. Locations where there is a community of a particularly dust sensitive species such as vascular species included in the Red Data List for Great Britain. Examples include a Special Area of Conservation (SAC) designated for acid heathlands or a local

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
	Examples include dwellings, museums and other culturally important collections, medium- and long-term car parks and car showrooms.	having equal sensitivity to residential areas for the purposes of this assessment.	site designated for lichens adjacent to the demolition of a large site containing concrete (alkali) buildings.
Medium	Users would expect to enjoy a reasonable level of amenity but would not reasonably expect to enjoy the same level of amenity as in their home. The appearance, aesthetics or value of their property could be diminished by soiling. The people or property would not reasonably be expected to be present here continuously or regularly for extended periods as part of the normal pattern of use of the land. Examples include parks and places of work.	Locations where the people exposed are workers and exposure is over a time period relevant to the air quality objective for PM10 (in the case of the 24-hour objectives, a relevant location would be one where individuals may be exposed for eight hours or more in a day). Examples include office and shop workers but will generally not include workers occupationally exposed to PM10, as protection is covered by Health and Safety at Work legislation.	Locations where there is a particularly important plant species, where its dust sensitivity is uncertain or unknown. Locations with a national designation where the features may be affected by dust deposition. Example is a Site of Special Scientific Interest (SSSI) with dust sensitive features.
Low	The enjoyment of amenity would not reasonably be expected. Property would not reasonably be expected to be diminished in appearance, aesthetics or value by soiling.	Locations where human exposure is transient. Indicative examples include public footpaths, playing fields, parks and shopping streets.	Locations with a local designation where the features may be affected by dust deposition. Example is a local Nature Reserve with dust sensitive features.

Sensitivity of Area	Dust Soiling	Human Receptors	Ecological Receptors
	There is transient exposure, where the people or property would reasonably be expected to be present only for limited periods of time as part of the normal pattern of use of the land. Examples include playing fields, farmland (unless commercially sensitive horticultural), footpaths, short term car parks and roads.		

Table D2 below presents the potential magnitude of change for dust emissions that will be used in undertaking the construction and decommissioning phase assessments. The descriptors included in this table are based upon the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction, V2.1' (2023).

Table D2: Construction and decommissioning phase assessments – scale of magnitude for dust emission impacts

Activity	Magnitude	Description
Demolition	Large	Total building volume >75,000 m^3, potentially dusty construction material (e.g., concrete), on-site crushing and screening, demolition activities >12 m above ground level.
	Medium	Total building volume 12,000 m^3 – 75,000 m^3, potentially dusty construction material, demolition activities 6 m – 12 m above ground level.
	Small	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber), demolition activities <6 m above ground, demolition during wetter months.
Earthworks	Large	Total site area >110,000 m^2, potentially dusty soil type (e.g., clay, which will be prone to suspension when dry due to small particle size), >10 heavy

Activity	Magnitude	Description
		earth moving vehicles active at any one time, formation of bunds >6 m in height.
	Medium	Total site area 18,000 m^2 – 110,000 m^2, moderately dusty soil type (e.g., silt), 5 – 10 heavy earth moving vehicles active at any one time, formation of bunds 4 – 6 m in height.
	Small	Total site area <18,000 m^2, soil type with large grain size (e.g., sand), <5 heavy earth moving vehicles active at any one time, formation of bunds <4 m in height.
Construction	Large	Total building volume >75,000 m^3, on site concrete batching, sandblasting.
	Medium	Total building volume 12,000 m^2 – 75,000 m^3, potentially dusty construction material (e.g., concrete), on site concrete batching.
	Small	Total building volume <12,000 m^3, construction material with low potential for dust release (e.g., metal cladding or timber).
Trackout	Large	>50 HDV (>3.5 t) outward movements in any one day, potentially dusty surface material (e.g., high clay content), unpaved road length >100 m.
	Medium	20 – 50 HDV (>3.5 t) outward movements in any one day, moderately dusty surface material (e.g., high clay content), unpaved road length 50 – 100 m.
	Small	<20 HDV (>3.5 t) outward movements in any one day, surface material with low potential for dust release, unpaved road length <50 m.

The sensitivity of receptor and magnitude of change will then be combined using the significance matrix as detailed in **Table D3** below to determine the potential risks from emissions from unmitigated demolition, earthworks, construction and trackout activities, which will be used to recommend site-specific mitigation measures. The classification of risk is based upon the IAQM 'Guidance on the Assessment of Dust from Demolition and Construction, V2.1' (2023).

Table D3: Construction and decommissioning phase assessments - risk classification of unmitigated impacts

Sensitivity of Area		Dust Emission Magnitude		
		Large	Medium	Small
Demolition	High	High Risk	Medium Risk	Medium Risk
	Medium	High Risk	Medium Risk	Low Risk
	Low	Medium Risk	Low Risk	Negligible
Earthworks	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Construction	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Medium Risk	Low Risk
	Low	Low Risk	Low Risk	Negligible
Trackout	High	High Risk	Medium Risk	Low Risk
	Medium	Medium Risk	Low Risk	Negligible
	Low	Low Risk	Low Risk	Negligible

Construction and decommissioning phase: traffic exhaust emissions impact

The significance of effects of exhaust emissions arising from vehicles during construction and decommissioning will be evaluated qualitatively using professional judgement and the principles of the EPUK/IAQM 'Land-Use Planning & Development Control: Planning for Air Quality' (2017) significance criteria. **Table D4** presents the EPUK-IAQM guidance screening criteria for when an air quality assessment might be required. If none of the criteria are exceeded, it is considered unlikely that there will be any significant effects on air quality.

Table D4: Air quality screening criteria from EPUK-IAQM 2017 guidance

The Development will…	Indicative Criteria to Proceed to an Air Quality Assessment
Cause a significant change in Light Duty Vehicle (LDV) traffic	A change of LDV flows of: • more than 100 AADT within or adjacent to an AQMA.

The Development will…	Indicative Criteria to Proceed to an Air Quality Assessment
slows on local roads with relevant receptors.	• more than 500 AADT elsewhere.
Cause a significant change in Heavy Duty Vehicle (HDV) flows on local roads with relevant receptors.	A Change of HDV flows of: • more than 25 AADT within or adjacent to an AQMA. • more than 100AADT elsewhere.
Realign roads, i.e., changing the proximity of receptors to traffic lanes.	Where the change is 5 m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	Where the change is 5 m or more and the road is within an AQMA.
Introduce a new junction or remove an existing junction near to relevant receptors.	Applies to junctions that cause traffic to significantly change vehicle accelerate / decelerate e.g., traffic lights, or roundabouts.
Introduce or change a bus station.	Where bus flows will change by: • more than 25 AADT within or adjacent to an AQMA. • more than 100AADT elsewhere.
Have an underground car park with extraction system.	The ventilation extract for the car park will be within 20 m of a relevant receptor. Coupled with the car park having more than 100 movements per day (total in and out).
Have one or more substantial combustion processes, where there is a risk of impacts at relevant receptors.	Typically, any combustion plant where the single or combined NO_x emission rate is less than 5 mg/sec is unlikely to give rise to impacts, provided that the emissions are released from a vent or stack in a location and at a height that provides adequate dispersion. In situations where the emissions are released close to buildings with relevant receptors, or where the dispersion of the plume may be adversely affected by the size and/or height of adjacent buildings (including situations where the stack height is lower than the receptor) then consideration will need to be given to potential impacts at much lower emission rates. Conversely,

The Development will…	Indicative Criteria to Proceed to an Air Quality Assessment
	where existing nitrogen dioxide concentrations are low, and where the dispersion conditions are favourable, a much higher emission rate may be acceptable.

Biodiversity

The determination of ecologically significant effects for ecological impact assessment (EcIA), as discussed below, is taken from 'Guidelines for Ecological Impact Assessment in the UK and Ireland' (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018 (Version 1.2 - updated April 2022))

For the purpose of EcIA, a significant effect is sufficiently important to require assessment and reporting so that the decision maker is adequately informed of the environmental consequences of permitting a project. It is a positive or negative effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales, from international to local.

A significant effect does not necessarily equate to an effect so severe that consent for the project should be refused planning permission. For example, many projects with significant negative ecological effects have been lawfully permitted following EIA procedures. Significant effects should be qualified with reference to an appropriate geographic scale. For example, a significant effect on a Site of Special Scientific Interest is likely to be of national significance. European case law is specific regarding significance in relation to European sites and the Habitats Directive. However, the scale of significance of an effect may not be the same as the geographic context in which the feature is considered important. For example, an effect on a species which is on a national list of species of principal importance for biodiversity may not have a significant effect on its national population. Examples of other relevant scales include regional and county. It should be noted that effects may be significant at the local scale, particularly in view of policies for no net loss of biodiversity.

When seeking mitigation and/or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and/or compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Determining ecologically significant effects

Designated/defined sites and ecosystems

The frames of reference used to describe the importance of each receptor, which are based on the Chartered Institute of Ecology and Environmental Management (CIEEM) Guidelines, are as follows:

- International (i.e. Ramsar sites, Special Areas of Conservation (SACs) and Special Protection Areas (SPAs)) (normally within the geographic area of Europe);
- UK or national (Great Britain but considering the potential for certain ecological features/receptors to be more notable (of higher importance) in England, with context relative to Great Britain as a whole).
- Regional;
- County;
- District; and
- Local (i.e. within approximately 5km of the Site).

Significant effects encompass impacts on the structure and function of defined sites and ecosystems. The following need to be determined:

- For designated sites – is the project and associated activities likely to undermine the conservation objectives of the site, or positively or negatively affect the conservation status of species or habitats for which the site is designated, or may it have positive or negative effects on the condition of the site or its interest/qualifying features?
- For ecosystems – is the project likely to result in a change in ecosystem structure and function?

Consideration should be given to whether:

- Any processes or key characteristics will be removed or changed.
- There will be an effect on the nature, extent, structure and function of component habitats.
- There is an effect on the average population size and viability of component species.

Consideration of functions and processes acting outside the formal boundary of a designated site is required, particularly where a site falls within a wider ecosystem e.g. groundwater dependent terrestrial ecosystems can be damaged where the proposed

activity impacts on the quantity or quality of groundwater that feeds these habitats. Predictions should always consider wider ecosystem processes.

Many ecosystems have a degree of resilience to perturbation that allows them to tolerate some biophysical change. Ecological effects should be considered in light of any information available or reasonably obtainable about the capacity of ecosystems to accommodate change.

Habitats and species

Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

In many cases (e.g. for species and habitats of principal importance for biodiversity), there may be an existing statement of the conservation status of a feature and objectives and targets against which the effect can be judged. However, not all species or habitats will be described in this way and the conservation status of each feature being assessed may need to be agreed with the relevant statutory nature conservation body and set out in the EcIA. The conservation status of a habitat or species will vary depending on the geographical frame of reference.

When assessing potential effects on conservation status, the known or likely background trends and variations in status should be taken into account. The level of ecological resilience or likely level of ecological conditions that would allow the population of a species or area of habitat to continue to exist at a given level, or continue to increase along an existing trend or reduce a decreasing trend, should also be estimated.

Precautionary principle

The evaluation of significant effects should always be based on the best available scientific evidence. If sufficient information is not available, further survey or additional research may be required. In cases of reasonable doubt, where it is not possible to robustly justify a conclusion of no significant effect, a significant effect should be assumed. Where uncertainty exists, it must be acknowledged in the EcIA.

Climate

Given the international urgency of climate change, the sensitivity of the receptor (i.e., global climate) to fluctuations in greenhouse gas emissions is considered ‘Very High’. Thus, the level of the significance of effects is determined by the magnitude, and timing, of greenhouse gas emissions and the likelihood of avoiding severe climate change.

Aligned with IEMA's Guide 'Assessing Greenhouse Gas Emissions and Evaluating their Significance 2nd Edition' (February 2022), any project that causes greenhouse gases to be avoided, or removed from the atmosphere, has a beneficial effect that is always significant (**Table D5**). In such a scenario, the project substantially exceeds the national net zero requirements and is thus aligned with the goal of the Paris Agreement to limit temperature rise to well below 2°C, aiming for 1.5°C.

The significance of the GHG impacts of Proposed Development on the climate will be determined by assessing the magnitude of emissions against the Local Authority's pro-rated carbon budget. The UK carbon budgets are only currently available to 2037 (6th carbon budget, 2033 – 2037); where carbon budgets are not available for certain assessment periods, a qualitative approach will be taken.

The renewable electricity from the Proposed Development is directly replacing that generated by fossil-fuel energy. Consequently, the GHG emissions savings from the operation of the Proposed Development will be assessed based upon a comparison of operational emissions per kWh energy generation against those from a gas-fuelled power station.

Table D5: Framework for assessment of significant effects

Significance	Level	Criteria
Significant	Major adverse	Project adopts a business-as-usual approach, not compatible with the national Net Zero trajectory, or aligned with the goals of the Paris Agreement (i.e., a science-based 1.5°C trajectory). Greenhouse gas impacts are not mitigated or reduced in line with local or national policy for projects of this type.
	Moderate adverse	Project's greenhouse gas impacts are partially mitigated, and may partially meet up-to-date policy; however, emissions are still not compatible with the national Net Zero trajectory or aligned with the goals of the Paris Agreement.
Not significant	Minor adverse	Project may have residual emissions, but the project is compatible with the goals of the Paris Agreement, complying with up-to-date policy and good practice.
	Negligible	Project has minimal residual emissions and goes substantially beyond the goals of the Paris Agreement, complying with up-to-date policy and best practice.
Significant	Beneficial	Project causes greenhouse gas emissions to be avoided or removed from the atmosphere, substantially exceeding the goals of the Paris Agreement with a positive climate impact.

Cultural Heritage

Importance of heritage assets

The importance of a heritage asset is a measure of the degree to which the heritage significance of that asset is sought to be protected through legislation, national planning policy and in the context of the Proposed Development, the East Riding of Yorkshire Local Plan (adopted 2016), namely policy ENV3 'Valuing our heritage'. The level of importance will therefore reflect any statutory and non-statutory heritage designation or, in the case of undesignated assets, the professional judgement of the assessor, as to the degree of importance that the asset has with reference to regional research frameworks.

The criteria presented in **Table D6** will be used to establish the importance of heritage assets. Assessment of importance is based on a combination of designated status and professional judgement. It takes into account the Secretary of State's criteria for the scheduling of ancient monuments and principles of selection criteria for Listed Buildings. It is also recognised that, occasionally, sites can have a lower or higher than normal importance within a particular environment. The assessment of importance therefore needs to take into account the part of the EIA study area that is being affected and the ability of the EIA study area to absorb change without compromising the understanding or appreciation of the historic environment.

Table D6: Criteria for establishing importance of heritage assets

Importance	Description of receptors
Very High	World heritage sites; assets of acknowledged international importance; assets that can contribute significantly to acknowledged international research objectives; Historic landscapes of international value (designated or not) and extremely well preserved historic landscapes with exceptional coherence, time depth or other critical factor(s).
High	Scheduled monuments and non-designated assets of schedulable quality and importance; Grade I and II* listed buildings and Grade II listed buildings that can be shown to have exceptional qualities in their fabric or associations; Conservation Areas with exceptional qualities; non-designated structures of clear national importance; designated and non-designated historic landscapes of historic interest; assets that can contribute significantly to acknowledged national research objectives.
Medium	Grade II listed buildings; Non-designated assets that contribute to regional research objectives; Locally listed buildings and other historic unlisted buildings that have exceptional qualities; Conservation Areas.
Low	Non-designated assets of local importance including those compromised by poor preservation; assets of limited value but with

Importance	Description of receptors
	the potential to contribute to local research objectives; robust non-designated historic landscapes.
Negligible	Assets with very little surviving archaeological interest; buildings of little architectural or historic note; landscapes with little historic interest.

Magnitude of impact

The magnitude of impact will reflect the scale of change which would be caused by the Proposed Development and the effect this would have on ability to interpret significance and appreciate the historic asset. Impacts can result either from physical changes to the fabric of a historic asset or through sensory changes within its setting.

An impact may be positive where, for example, as part of the Proposed Development, an intrusive building or feature is removed or replaced with a more harmonious one; historic features are restored or revealed; a new feature is added which adds to public appreciation; new views are introduced that add to public experience of an asset; or public interpretation or access is improved to an asset or its setting.

Impacts may impart major change, for example where groundworks completely destroy important archaeological remains, to minor change to part of a historic assets' setting, leading to a limited impact on our ability to interpret it, or its context.

Utilising the key principles for assessing the implications of change outlined above, an assessment of the magnitude of impact will be implemented for each baseline heritage asset using the criteria presented in **Table D7** below. In the absence of directly applicable English guidance, these criteria have been derived from the guidance produced by Scottish Natural Heritage and Historic Environment Scotland.

Conclusions of the assessed magnitude of impacts are a product of the consideration of the elements of an asset and its setting that contribute to its heritage significance and the degree to which the Proposed Development would change these contributing elements. The assessment therefore reflects the varying degrees of sensitivity of different assets to change brought about by different types of development.

Table D7: Criteria for classifying magnitude of impact

Impact Magnitude	Criteria
Major	Change to key historic building elements so that an asset is totally altered; OR change to most/all key archaeological materials such that the resource is totally altered; OR comprehensive change to the setting such that the significance of the asset is severely compromised.

Impact Magnitude	Criteria
Moderate	Change to many key historic building elements, such that the asset is significantly modified; changes to many key archaeological materials such that the resource is clearly modified; changes to setting of an asset, such that the significance of the asset is compromised.
Minor	Change to key historic building elements, such that the asset is slightly different; changes to key archaeological materials such that the asset is slightly altered; changes to setting of an historic building, such that its significance is slightly compromised.
Negligible	Very minor changes to historic building elements, archaeological materials or setting that hardly affect them/it.
No Change	No change to fabric, archaeological materials or setting.

Significance of effect

The assessment of effects will combine analysis of the data gathered during the desk-based assessment and site visit, photographs and any wireframe visualisations of the topography and Proposed Development.

These assessments will be carried out using professional judgement, taking into account designations and heritage significance as assessed against the following national standards:

- CIfA's *Standard and Guidance for Historic Environment Desk-Based Assessment* (2014, revised 2017 and 2020);
- Historic England's *Historic Environment Good Practice Advice in Planning GPA3, The Setting of Heritage Assets* (2017);
- Historic England Advice Note 12, *Statements of Heritage Significance: Analysing Significance in Heritage Assets* (2019);
- Historic England's *Historic Environment Good Practice Advice in Planning GPA2, Managing Significance in Decision-Taking in the Historic Environment* (2015); and
- IEMA, IHBC and CIfA's *Principles of Cultural Heritage Impact Assessment in the UK* (2021).

Significance of effect will be based on a combination of importance of the asset (receptor) and the magnitude of impact upon that asset (receptor). The significance of effect matrix is presented in **Table D8** below and provides a guide to decision-making but is not a substitute for professional judgement and interpretation, particularly where the importance or impact magnitude levels are not clear or are borderline between categories. The significance of effect may be described on a continuous scale from

'No effect' to 'Major'. In the absence of directly applicable English guidance, these criteria have been derived from the guidance produced by Scottish Natural Heritage and Historic Environment Scotland.

Major and Moderate effects are regarded as significant, while Minor and Negligible effects are not significant.

Table D8: Criteria for assessing the significance of effect

Magnitude of Impact	Importance				
	Negligible	**Low**	**Medium**	**High**	**Very High**
Major	Minor	Moderate	Moderate	Major	Major
Moderate	Negligible	Minor	Moderate	Moderate	Major
Minor	Negligible	Negligible	Minor	Minor	Moderate
Negligible	Negligible	Negligible	Negligible	Minor	Minor
No Change	No effect	No effect	No effect	No effect	No effect

Landscape and Visual

The Guidelines for Landscape and Visual Impact Assessment (Third Edition) (GLVIA3) are widely recognised as the primary source of guidance for Landscape and Visual Impact Assessment (LVIA) in the UK but clearly state that:

"*The guidance concentrates on principles while also seeking to steer specific approaches where there is a general consensus on methods and techniques. It is not intended to be prescriptive, in that it does not provide a detailed 'recipe' that can be followed in every situation. It is always the primary responsibility of any landscape professional carrying out an assessment to ensure that the approach and methodology adopted are appropriate to the particular circumstances.*" (paragraph 1.20)

GLVIA 3 also states that: "*professional judgement is a very important part of the LVIA*" (paragraph 2.23) and that "*in all cases there is a need for the judgements that are made to be reasonable and based on clear and transparent methods so that the reasoning applied at different stages can be traced and examined by others.*" (paragraph 2.24).

It goes on to state that "*there are no hard and fast rules about what effects should be deemed significant but LVIAs should always distinguish clearly between what are considered to be the significant and non-significant effects.*" (paragraph 3.32)

Landscape and visual assessments are separate, though linked processes which GLVIA3 notes are "*related but very different considerations*". The assessment of the potential effect on the landscape is carried out as an effect on the environmental

resource (i.e., the landscape). Visual effects are assessed as an inter-related effect on people.

In accordance with GLVIA3, the significance of landscape effects is determined by combining judgements regarding the sensitivity of the receiving landscape and the magnitude of the landscape effects arising from the Proposed Development.

In accordance with GLVIA3, the significance of visual effects is determined by combining judgements regarding the sensitivity of visual receptors (people who view the landscape) and the magnitude of the change they experience arising from the Proposed Development.

Landscape sensitivity

As stated in GLVIA3, "*LVIA sensitivity is similar to the concept of landscape sensitivity used in the wider arena of landscape planning, but is not the same*." In LVIA, landscape sensitivity is assessed by combining judgements about the value attached to a landscape and its susceptibility to the type of change and nature of the development proposed. The overall sensitivity of the landscape to a particular development is described as High, Medium or Low.

- **Landscape value** varies in relation to the different stakeholders and different parts of society that use or experience a landscape. It reflects the importance attached to a landscape. Sometimes it is used as a basis for designation or recognition which expresses national or local authority consensus, because of its special qualities/attributes. Although factors such as formal designations are an important component when determining landscape value, other aspects are also considered as part of the judgement process**,** as explained in Landscape Institute Technical Guidance Note 02-21**:** Assessing Landscape Value Outside National Designations. These include issues related to natural and cultural heritage (for example ecological, geological or heritage matters), landscape condition, associations (in terms of connections with people, arts or events), distinctiveness (i.e., a sense of unique identity in the landscape), recreational opportunities, perceptual aspects (including scenic quality, wildness and tranquillity) and landscapes with a clearly identifiable role or function. In the LVIA, the value attributed to the landscape will be described as**:** National, Regional, or Community.
- **Landscape susceptibility** according to GLVIA3 means "*the ability of the landscape receptor to accommodate the proposed Development without undue consequences for maintenance of the baseline situation and/or the achievement of landscape planning policies and strategies*" (paragraph 5.40). The susceptibility of the landscape varies depending on the type of development proposed and the particular site location. Judgements on landscape susceptibility include references to both the physical and aesthetic characteristics and the potential scope for mitigation. In the LVIA, the susceptibility of the landscape will be described as**:** High, Medium or Low.

The criteria and the detailed judgements regarding susceptibility and value of landscape receptors will be set out in the LVIA.

Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor as illustrated by **Table D9** below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Table D9: Landscape sensitivity criteria

Value	Susceptibility		
	High	**Medium**	**Low**
National	High	High/medium	Medium
Regional	High/Medium	Medium	Medium/Low
Community	Medium	Medium/Low	Low

Magnitude of landscape change

The magnitude of change arising from the Proposed Development at any particular location is assessed in terms of its "*size or scale, geographic extent of the area or receptor that is influenced and its duration and reversibility*." (paragraph 5.48).

Judgements concerning the scale of the change take account of:

- Degree of loss or alteration to key landscape features/elements; characteristics; and for designated areas – special qualities and/or purposes of designation;
- Distance from the Proposed Development; and
- Landscape context to the Proposed Development.

The approach to assessing effects on landscape character is to consider the key characteristics for the Landscape Character Area (LCA) within which the Proposed Development is located (the host LCA) and if relevant the adjacent LCAs (non-host) and identify which of these the Proposed Development would affect. A large-scale change in landscape character is likely to occur where key characteristics would be lost or substantially changed. A small-scale change is likely to occur where key characteristics are altered to a lesser degree and this can be influenced by distance and surrounding context.

Where particular views are a key characteristic of a LCA, large or medium scale landscape character effects may occur where the Proposed Development becomes a key feature of those views. A similar approach applies to designated landscapes, for which the effects on the defined purposes of designation and special qualities are considered.

The scale of landscape change is described as: Large, Medium or Small.

Having established the scale of change to the landscape baseline, the geographic extent of the change can be identified and is described as: Wide, Intermediate, Localised or Limited.

Duration and reversibility can be linked depending on the nature of the development. Reversibility is a judgement about the practicality of reversing the landscape effects of the proposed development (for example, solar farms are ultimately largely reversible whilst housing is permanent). Duration reflects how long the change will last. In the LVIA, the duration of the change will be considered:

- Short term when lasting less than 2 years;
- Medium term when lasting between 2 and 10 years;
- Long term when lasting between 10 and 40 years; and
- Permanent for more than 40 years.

Magnitude is considered taking into account the three contributory factors, as illustrated by the diagrams presented in **Figure D1** below.

Visual sensitivity

In LVIA, visual receptor sensitivity is assessed by combining judgements about the value attached to views and the susceptibility of the viewer to the type of change and nature of the development proposed. The overall sensitivity of the visual receptor to a particular development is described as: High, Medium or Low.

- The value of public views, which is the focus of GLVIA3, will vary depending on the nature, location and context of the view and the recognised importance of the view. Considerations include cultural associations; designation or policy protection; views of or from landmarks; and/or the scenic quality of the view. It should be noted that the value attributed relates to the value of the view only (e.g., a National Trail is nationally valued for access, but not always for the available views from every section). In the LVIA, the value attributed to visual amenity will be described as: National, Regional, or Community.
- Susceptibility of visual receptors: Those living within view of the Proposed Development are usually regarded as the highest susceptibility group as well as those engaged in outdoor pursuits for whom landscape experience is the primary objective. The susceptibility of potential visual receptors will also vary depending on the activity of the receptor. For visual receptors, susceptibility and value are closely linked - the most valued views are also likely to be those where viewer's expectations will be highest. In the LVIA, visual receptor susceptibility will be defined in accordance with the criteria below:
    - High - Local residents; users of outdoor recreation focussed on the appreciation of views including footpaths, beauty spots and picnic areas and people experiencing views to or from important features of physical, visual, cultural or historic interest.

- Medium - Local road users and travellers on trains. People engaged in outdoor recreation with some appreciation of the landscape e.g., road cycling, nature conservation, golf and water based recreation.
- Low - Workers, users of facilities and commercial buildings (indoors) experiencing views from buildings. Road and rail users on fast moving commuting or trunk routes. Visual receptors where views are incidental to the activity and/or location.

Sensitivity is judged taking into account the component judgments about the value and susceptibility of the receptor, as illustrated by **Table D10** below. Where sensitivity is judged to lie between levels, an intermediate assessment will be adopted.

Table D10: Visual sensitivity criteria

Value	Susceptibility		
	High	**Medium**	**Low**
National	High	High / Medium	Medium
Regional	High / Medium	High / Medium	Medium / Low
Community	High / Medium	Medium	Low

Magnitude of visual change

The magnitude of visual change arising from the Proposed Development is assessed in terms of its size or scale, geographic extent of the area or receptor that is influenced and its duration.

The scale of change arising from the proposed development as experienced by a visual receptor group reflects the degree to which the nature of the views from that location would be changed taking into account:

- The distance from the Proposed Development;
- The degree to which the Proposed Development is visible or screened;
- The angle of view in relation to main receptor activity or main focus of the view;
- The horizontal and vertical field of view occupied by the Proposed Development; and
- The extent and nature of other built development visible.

The scale of change in view is described as: Large, Medium or Small.

The approach to assessing effects on views is to consider the full 360-degree view from any given receptor – not just those towards the development and/or shown in visualisations. It is assumed that the change would be seen in clear visibility and the assessment is carried out on that basis. Seasonal variations in visibility due to varying vegetation cover is also taken into account in all judgements.

For visual receptors moving through the landscape (e.g., along footpaths, roads), the length of their journey during which they would see the proposed development is reflected in the judgement of the geographic extent of effects. In the LVIA, the geographical extent of visual change will be described as: Wide, Intermediate, Localised or Limited.

Duration reflects how long the change will last and judgements are framed in the same way as described above for landscape effects. In the LVIA, the duration of the change will be considered:

- Short term when lasting less than 2 years;
- Medium term when lasting between 2 and 10 years;
- Long term when lasting between 10 and 40 years; and
- Permanent for more than 40 years.

Magnitude is considered taking into account the three contributory factors, as illustrated by the diagrams presented in **Figure D1** below.

Combining scale of change, extent and duration to determine magnitude of landscape and visual effects

Scale of change is the first and primary factor in determining magnitude. Geographical extent and duration of the effect are modifying factors to the overall magnitude judgement which may be higher if the effect is particularly widespread and/or long lasting, or lower if it is constrained in geographic extent and/or timescale.

The diagrams presented below in **Figure D1** illustrate in outline how these judgements are considered as a two-stage process. They are not intended to be interpreted rigidly as a chart to provide definitive answers; professional judgement is employed as appropriate to arrive at an overall magnitude judgement.

Firstly, scale and extent are considered, for which the outcomes are illustrated by the first part of the diagram; the second part of the diagram illustrates the influence of duration on this initial judgement.

In the LVIA, the magnitude of effects will be described as: Substantial, Moderate, Slight or Negligible. Where magnitude is judged to lie between levels, based upon professional judgement, an intermediate assessment will be adopted, such as Moderate to Slight.

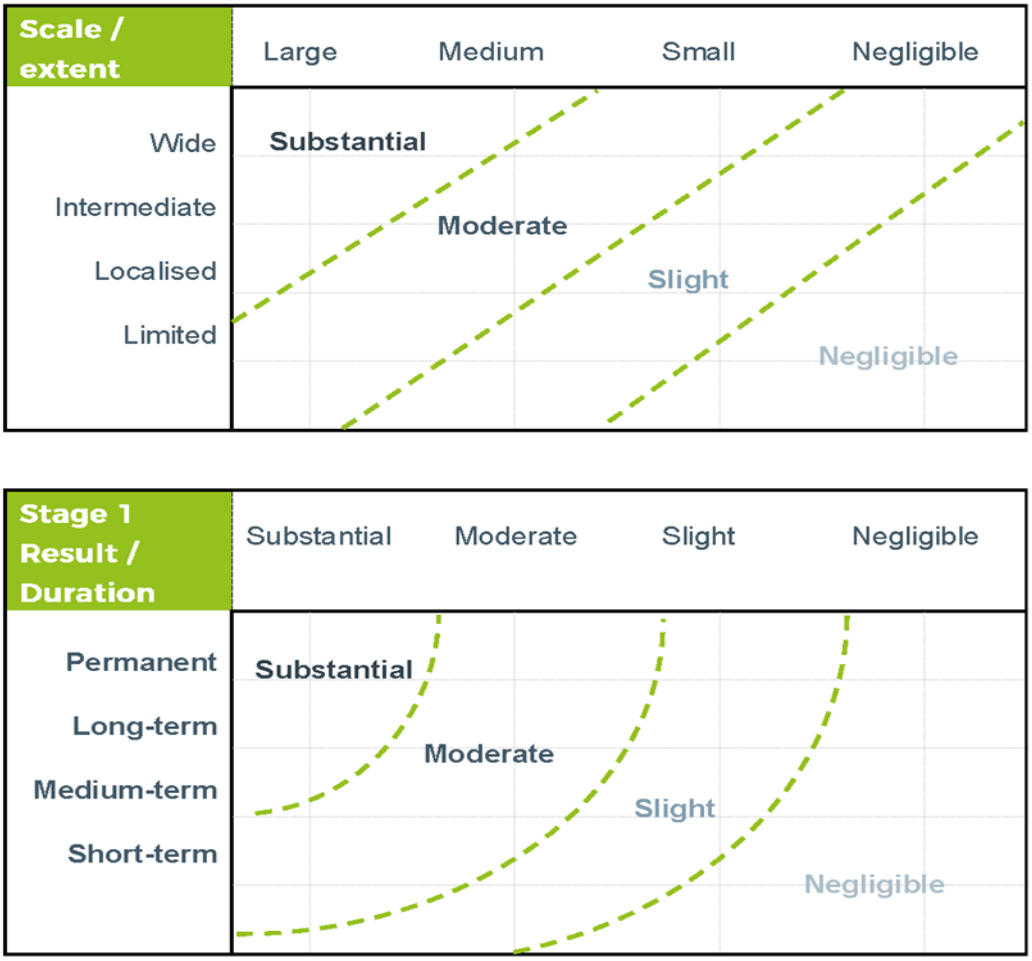

Figure D1 Scale of effect diagrams

Significance of landscape and visual effects

The significance of any identified landscape or visual effect will be assessed as Major, Moderate, Minor or Negligible. These categories are based on the consideration of sensitivity with the predicted magnitude of change. **Table D11** below is not used as a prescriptive tool and illustrates the typical outcomes, allowing for the exercise of professional judgement. In some instances, a particular parameter may be considered as having a determining effect on the analysis.

Table D11: Significance of effect criteria

Receptor Sensitivity	Magnitude of Change			
	Substantial	**Moderate**	**Slight**	**Negligible**
High	Major	Major / Moderate	Moderate	Minor
Medium	Major / Moderate	Moderate	Moderate / Minor	Minor / Negligible
Low	Moderate	Moderate / Minor	Minor	Negligible

Where the effect has been classified as Major or Major/Moderate, this is considered to be equivalent to a likely significant effect. Where 'Moderate' effects are predicted, professional judgement will be applied to determine whether the effect is significant or not ensuring that the potential for significant effects to arise has been thoroughly considered.

Landscape and visual effects can be beneficial or adverse and, in some instances, may be considered neutral. Neutral effects are those which overall are neither adverse nor positive but may incorporate a combination of both. Whether an effect is beneficial, neutral or adverse is identified based on professional judgement. GLVIA3 indicates at paragraph 2.15 that this is a "*particularly challenging*" aspect of assessment, especially in the context of a changing landscape.

However, for the avoidance of doubt, in the LVIA it will be assumed that where new infrastructure is introduced into the landscape or views, this will generally constitute an adverse effect. Any variation from this stance will be clearly justified in the LVIA.

Land, Soils and Groundwater

Land (potential contamination)

Receptor sensitivity

There are no published guidelines or criteria for assessing and evaluating effects on geology, hydrogeology or soils within the context of an EIA. The sensitivity criteria used in the assessment have therefore been derived from the Construction Industry Research and Information Association (CIRIA) document Contaminated Land Risk Assessment (A guide to good practice) C552, 2001. The sensitivity criteria are defined in **Table D12**.

Table D12: Receptor sensitivity

Sensitivity	Definition
Very High	The receptor is highly sensitive and could be easily damaged by activities associated with the Proposed Development. The receptor is likely to be of national significance. The recovery of the receptor is either impossible or very long term.
High	The receptor is of high sensitivity and is of importance at a local or regional level. The receptor is vulnerable to the effects of the Proposed Development and recovery would be slow and/or costly (e.g., remedial measures to groundwater may be required to prevent a wider impact).
Medium	The receptor is of medium value and is likely to be of local importance. The receptor is slightly vulnerable to impacts from the Proposed Development and would be expected to recover over a moderate timescale (e.g., up to 5 years for groundwater to return to its current or an improved condition).
Low	The receptor is of low value and has little contribution to local, regional or national resources. The receptor is not generally vulnerable to impacts that may arise from the Proposed Development and/or will recover over a short timescale (e.g., up to 1 year before groundwater returns to its current or improved condition).
Negligible	The receptor is of negligible positive value. The receptor is not vulnerable to impacts that may arise from the Proposed Development and/or will recover quickly.

Magnitude of impact

Where an impact is considered to be present, the magnitude of impact will be classified using the criteria presented in **Table D13** below. These are also derived from CIRIA's Contaminated Land Risk Assessment (A guide to good practice) C552, 2001. Impacts can be beneficial or adverse.

Table D13: Magnitude of impact criteria

Magnitude of impact	Definition
Major	These impacts are likely to be important considerations at a regional or district scale, and if adverse, are potential concerns, depending upon the relative importance attached to the issue during the decision-making process. Mitigation measures and

Magnitude of impact	Definition
	detailed design work are unlikely to remove all the impacts upon the affected communities or interests. Examples include short term (acute) risk to human health likely to result in 'significant harm' as defined by the Environment Protection Act 1990, Part IIA; short-term risk of pollution of sensitive water resources; catastrophic damage to buildings or property; and short-term risk to an ecosystem or part of an ecosystem.
Moderate	These impacts, if adverse, while important at a local scale, are not likely to be key decision-making issues. The cumulative effect of such issues may lead to an increase in the overall impacts on a particular area or on a particular resource. They represent issues where impacts will be experienced but mitigation measures and detailed design work may ameliorate/enhance some of the consequences upon affected communities or interests. Some residual impacts will still arise. Examples include chronic damage to human health ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000); pollution of sensitive water resources; and significant change in an ecosystem or organism forming part of that ecosystem.
Minor	These impacts may be raised as local issues but are unlikely to be of importance in the decision-making process. Nevertheless, they are of relevance in the detailed design of the Proposed Development and consideration of mitigation or compensation measures. Examples include pollution of non-sensitive water resources; significant damage to crops, buildings, structures and services ('significant harm' as defined in 'Draft Circular on Contaminated Land', DETR 2000); and damage to sensitive buildings, structures or the environment.
Negligible	No change or a barely perceptible change from the baseline position. Examples include non-permanent human health impacts easily prevented by use of personal protective clothing; and easily repairable damage to buildings, structures and services.
No change	No change from baseline conditions

Significance of effect

The significance of effect will be based on the sensitivity of the receptor and the magnitude of impact, as outlined in **Table D14** below and derived from CIRIA's Contaminated Land Risk Assessment (A guide to good practice) C552, 2001. The significance of effect can be adverse or beneficial.

Table D14: Significance of effect criteria

Sensitivity	Magnitude of Impact			
	Major	**Moderate**	**Minor**	**Negligible**
Very High	Very High	High	Moderate	Moderate / Low
High	High	Moderate	Moderate / Low	Low
Medium	Moderate	Moderate / Low	Low	Very Low
Low	Moderate / Low	Low	Very Low	Very Low
Negligible	Low	Very Low	Very Low	Very Low

Land (soils and agricultural land)

Receptor sensitivity

Sensitivity criteria for land and soils, derived from the IEMA Guide 'A New Perspective on Land and Soil in Environmental Impact Assessment' (February 2022) are defined in **Table D15**.

Table D15: Receptor sensitivity

Sensitivity (in-situ soils)	Soil Resource
Very High	**Biomass production**: ALC Grades 1 & 2 or Land Capability for Agriculture (LCA) Classes 1 & 2 **Ecological habitat, soil biodiversity and platform for landscape**: Soils supporting protected features within a European site (e.g., SAC, SPA, Ramsar); Peat soils; Soils supporting a National Park, or Ancient Woodland **Soil carbon**: Peat soils Soils with potential for ecological/landscape restoration

Sensitivity (in-situ soils)	Soil Resource
	Soil hydrology: Very important catchment pathway for water flows and flood risk management **Archaeology, Cultural heritage, Community benefits and Geodiversity**: Scheduled Ancient Monuments (SAMs) and adjacent areas; World Heritage and European designated sites; Soils with known archaeological interest; Soils supporting community/recreational/educational access to land covered by National Park designation **Source of materials**: Important surface mineral reserves that would be sterilised (i.e., without future access)
High	**Biomass production**: ALC Grade 3a, or LCA Grade 3.1 **Ecological habitat, soil biodiversity and platform for landscape**: Soils supporting protected features within a UK designated site (e.g., UNESCO Geoparks, Sites of Special Scientific Interest (SSSI) or Areas of Outstanding Natural Beauty (AONB), Special Landscape Area, and Geological Conservation Review sites); Native Forest and woodland soils; Unaltered soils supporting semi-natural vegetation (including UKBAP Priority habitats) **Soil carbon**: Organo-mineral soils (e.g., peaty soils) **Soil hydrology**: Important catchment pathway for water flows and flood risk management **Archaeology, Cultural heritage, Community benefits and Geodiversity**: Soils with probable but as yet unproven (prior to being revealed by construction) archaeological interest; Historic parks and gardens; Regionally Important Geological and Geomorphological Sites (RIGS); Soils supporting community /recreational/educational access to RIGS and AONBs **Source of materials**: Surface mineral reserves that would be sterilised (i.e. without future access)
Medium	**Biomass production**: ALC Grade 3b or LCA Grade 3.2 **Ecological habitat, soil biodiversity and platform for landscape**: Soils supporting protected or valued features within non-statutory designated sites (e.g. Local Nature Reserves (LNR), Local Geological Sites (LGSs), Sites of Nature Conservation Importance (SNCIs), Special Landscape Areas; Non-Native Forest and woodland soils **Soil carbon**: Mineral soils **Soil hydrology**: Important minor catchment pathway for water flows and flood risk management **Archaeology, Cultural heritage, Community benefits and Geodiversity**: Soils with possible but as yet unproven (prior to

Sensitivity (in-situ soils)	Soil Resource
	being revealed by construction) archaeological interest; Soils supporting community/recreational/educational access to land **Source of materials**: surface mineral reserves that would remain accessible for extraction
Low	**Biomass production**: ALC Grades 4 & 5 or LCA Grades 4.1 to 7 or Urban soils **Ecological habitat, soil biodiversity and platform for landscape**: Soils supporting valued features within non-designated notable or priority habitats/landscapes. Agricultural soils **Soil carbon**: Mineral soils **Soil hydrology**: Pathway for local water flows and flood risk management **Archaeology, Cultural heritage, Community benefits and Geodiversity**: Soils supporting no notable cultural heritage, geodiversity nor community benefits; Soils supporting limited community/recreational/ educational access to land **Source of materials**: Surface mineral reserves that would remain accessible for extraction
Negligible	As for low sensitivity, but with only indirect, tenuous, and unproven links between sources of impact and soil functions

Magnitude of impact

Where an impact is considered to be present, the magnitude of the impact is classified using the criteria presented in **Table D16** below, which is derived from the IEMA Guide 'A New Perspective on Land and Soil in Environmental Impact Assessment' (February 2022).

Table D16: Magnitude of Impact

Magnitude of impact (change)	Description of Impacts Restricting Proposed Land Use
Major	Permanent, irreversible loss of one or more soil functions or soil volumes (including permanent sealing or land quality downgrading), over an area of more than 20ha or loss of soil-related features, as advised by other topic specialists in EIA team (including effects from 'temporary developments'*); or Potential for permanent improvement in one or more soil functions or soil volumes due to remediation or restoration over an area of more than 20ha, or gain in soil-related features, as

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

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

Significance of effect

The significance of effect is based on the sensitivity of the receptor and the magnitude of impact, as outlined in **Table D17** below. The significance of effect can be adverse or beneficial.

The significance of an effect is reported as either 'significant' or 'not significant'. Any effects that have been determined as 'Moderate' or above are considered to be significant. Any effects that have been determined as 'Slight' or below are considered not significant.

Table D17: Significance of effect criteria

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

Noise and Vibration

The methods for assessing the significance of noise from construction activities are provided within Annex E of BS 5228. One such method of applying significance to noise effects is repeated in Table **D18** below.

Table D18: Criteria for assessing the significance of noise from construction activities

Assessment Category and Threshold Value Period, L_{Aeq}	**Threshold Value in Decibels, dB**		
	Category A[1]	**Category B**[2]	**Category C**[3]
Night-time (23.00−07.00)	45	50	55
Evenings and weekends [4]	55	60	65
Daytime (07.00−19.00) and Saturdays (07.00−13.00)	65	70	75

[1] **Category A: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are less than these values.**

[2] **Category B: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are the same as category A values.**

[3] **Category C: threshold values to use when ambient noise levels (when rounded to the nearest 5 dB) are higher than category A values.**

[4] **19.00–23.00 weekdays, 13.00–23.00 Saturdays and 07.00–23.00 Sundays.**

A significant effect has been deemed to occur if the site noise level (construction only) exceeds the threshold level for the category appropriate to the ambient noise level for a month or more. If the baseline ambient noise level exceeds the Category C values, then a significant effect is deemed to occur if the total noise level (construction + ambient noise) for the period increases by more than 3 dB.

Works for a shorter duration that might result in a significant effect are considered by using the trigger levels for sound insulation and time criteria from Annex E.4 of BS 5228-1.

BS 5228-2: 2009 +A1:2014 'Code of practice for noise and vibration control on construction and open sites. Vibration'

BS 5228-2:2009+A1:2014 'Code of practice for noise and vibration control on construction and open sites. Vibration' (BS5228) provides guidance on vibration levels that can be used to assess the likely impacts of construction activities on buildings and on humans. Annex B of the standard gives guidance on the significance of vibration effects in terms of human response to vibration and structural response, as presented in **Table D19** and **Table D20** respectively below.

Table D19: Guidance on effects of vibration levels perceptible on humans during construction

Vibration Level (PPV)	Effect
0.14 mms^{-1}	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3 mms^{-1}	Vibration might be just perceptible in residential environments.
1.0 mms^{-1}	It is likely that vibration of this level in residential environments will cause complaint but can be tolerated if prior warning and explanation has been given to residents.
10 mms^{-1}	Vibration is likely to be intolerable for any more than a very brief exposure to this level.

Table D20: Transient vibration guide values for cosmetic damage during construction

Line	Type of Building	Peak component particle velocity in frequency range of *predominant pulse*	
		4 Hz to 15 Hz	15 Hz and above
1	Reinforced or framed structures / industrial and heavy commercial buildings.	50 mms^{-1} at 4 Hz and above.	
2	Unreinforced or light framed structures.	15 mms^{-1} at 4 Hz increasing to 20 mms^{-1} at 15 Hz.	20 mms^{-1} at 15 Hz increasing to 50 mms^{-1} at 40 Hz and above.
	Residential or light commercial buildings.		
Note 1 – values referred to are at the base of the building. **Note 2 – for line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.**			

BS5228 states that the guide values in **Table D20** predominantly relate to transient vibration which does not give rise to resonant responses in structures, and to low-rise buildings. Where the dynamic loading caused by continuous vibration is such as to give rise to dynamic magnification due to resonance, especially at the lower frequencies where lower guide values apply, then the guide values in **Table D20** might need to be reduced by up to 50%.

British Standard 4142: 2014 + A1: 2019 'Methods for rating and assessing industrial and commercial sound'

BS 4142:2019 describes the methods for rating and assessing noise from industrial or commercial sources, including manufacturing processes, fixed installations and plant equipment, loading of goods and sound from mobile plant. The standard is applicable for the purpose of assessing sound at dwellings, through the determination of a rating level of an industrial or commercial noise source.

Where certain acoustic features are present at the assessment location, a character correction should be applied to the specific sound level to give the rating level to be used in the assessment.

- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5 dB is likely to be an indication of adverse impact depending on the context.

- Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact depending on the context.

Where the initial estimate of the impact needs to be modified due to the context, all pertinent factors should be taken into account, including:

- The absolute level.
- The character and level of the residual sound.
- The sensitivity of the receptor and whether dwellings will already (or likely) to incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as: i) façade insulation treatments, ii) ventilation and/or cooling, and iii) acoustic screening.

The criteria in **Table D21** below will be adopted for the assessment of magnitude of impact. The criteria have been developed based on the guidance detailed below.

Table D21: Magnitude of noise impact criteria

Impact	Magnitude Criteria			
	Negligible	Low	Medium	High
Construction and decommissioning phases – daytime noise (BS 5228-1:2009+A1: 2014)	Less than 55 dB $L_{Aeq,T}$	Between 55 and 65 dB $L_{Aeq,T}$	Between 66 and 75 dB $L_{Aeq,T}$	Greater than 75 dB $L_{Aeq,T}$
Construction and decommissioning phases – night-time noise (BS 5228-1:2009+A1: 2014)	Less than 40 dB $L_{Aeq,T}$	Between 40 and 45 dB $L_{Aeq,T}$	Between 46 and 55 dB $L_{Aeq,T}$	Greater than 55 dB $L_{Aeq,T}$
Construction phase and decommissioning - road traffic noise (DMRB LA 111 'Noise and Vibration')	Less than 1 dB increase in road traffic noise	1.0 to 2.9 dB increase in road traffic noise	3.0 to 4.9 dB increase in road traffic noise	Greater than or equal to 5 dB increase
Construction and decommissioning phases – vibration (BS 5228-2:2009+A1: 2014)	Less than 0.3 mm/s PPV	0.3 to less than 1.0 mm/s PPV	1.0 to 9.9 mm/s PPV	Greater than or equal to 10 mm/s PPV
Operational phase – daytime noise (BS	Rated noise level equal to	Rated noise level	Rated noise level	Rated noise level

Impact	Magnitude Criteria			
	Negligible	Low	Medium	High
4142: 2014 + A1: 2019 / WHO, 1999 / BS 8233: 2014)	or less than 35 dB $L_{Ar, T}$	between 36 and 40 dB $L_{Ar, T}$	between 41 and 50 dB $L_{Ar, T}$	greater than 50 dB $L_{Ar, T}$
Operational phase – night-time noise (BS 4142: 2014 + A1: 2019 / WHO, 1999 / BS 8233: 2014)	Rated noise level equal to or less than 30 dB $L_{Ar, T}$	Rated noise level between 31 and 35 dB $L_{Ar, T}$	Rated noise level between 36 and 45 dB $L_{Ar, T}$	Rated noise level greater than 45 dB $L_{Ar, T}$
Notes 1 - Operational phase noise criteria are based on rated noise levels as defined in BS 4142: 2014+A1: 2019.				

With regards to the operational magnitude criteria, BS 4142 advises that where rating levels and background levels are low, which is typically the case in rural areas, the assessment of operational noise should take into context the absolute noise level. The ANC Guide to BS 4142 provides context to this by stating:

"BS 4142 does not define 'low' in the context of background sound levels nor rating levels. The note to the Scope of the 1997 version of BS 4142 defined very low background sound levels as being less than about 30 dB LA90, and low rating levels as being less than about 35 dB $L_{Ar,Tr}$".

The Association of Noise Consultants (ANC) Guide suggests that: *"…similar values would not be unreasonable in the context of BS 4142, but that the assessor should make a judgement and justify it where appropriate".*

In this case, it is considered that a minimum rating level of 40 dB $L_{Ar,Tr}$ during the daytime, and 35 dB $L_{Ar,Tr}$ for the low magnitude impact criteria, would align with Planning Practice Guidance, which defines noise below the lowest observed adverse effect level (LOAEL) as follows:

"Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life".

Based on the measured baseline noise levels, residual noise levels ($L_{Aeq, T}$) are equal to or less than the applied rating level design targets applied to the low magnitude criteria. This is considered to successfully apply the concepts of a lowest observed adverse effect level (LOAEL) within Planning Practice Guidance and 'context' within BS 4142.

Furthermore, BS 8233:2014 'Guidance on sound insulation and noise reduction for buildings' and the World Health Organisation (WHO) 'Guidelines for Community Noise' (1999) provide guidance levels for internal noise within dwellings of 30 dB $L_{Aeq,T}$ for

good sleeping conditions at night. However, residents are likely to be inside their properties at night. BS 8233:2014 states that building envelope attenuation would be reduced by approximately 15 dB for a partially open window. Consequently, an external high magnitude criteria, indicating a significantly adverse effect level (SOAEL) of 45 dB $L_{Ar,Tr}$ has been adopted for the night-time.

Based on the adaptation of absolute limits, WHO 1999 provides guidance on permissible levels above which adverse effects are likely to occur. Therefore, the criteria for LOAEL and SOAEL adopted within this assessment are considered as a design limit, above which the onset of LOAEL and SOAEL would occur.

Assessment criteria

The overall significance of an effect is determined by combining the sensitivity of the receptor and the magnitude of impact (as presented in **Table D22**). The assessment of significance relies on best practice, the relevant published standards and guidance documents, and professional judgement.

Table D22: Determining Significance of effects

Magnitude of impact	Sensitivity of receptor/receiving environment to change			
	High	Medium	Low	Negligible
High	Major	Moderate	Minor	Negligible
Medium	Moderate	Minor	Negligible	Negligible
Low	Minor	Negligible	Negligible	Negligible
Negligible	Negligible	Negligible	Negligible	Negligible

Based on the above, assessment criteria used to establish significance of effect from the Proposed Development will be developed and agreed with the Environmental Health Officer at East Riding of Yorkshire Council.

Transport and Access

The Institute of Environmental Management and Assessment (IEMA) Environmental Assessment of Traffic and Movement (2023) will be used to characterise the environmental traffic and transport effects (off-site effects) and the assessment of significance. The guidelines intend to complement professional judgement and the experience of trained assessors.

In terms of traffic and transport impacts, the receptors are the users of the roads within the study area and the locations through which those roads pass.

The sensitivity of receptors is detailed in **Table D23** and **Table D24** below. The assessment will only consider the construction phase.

Table D23: Classification of receptor sensitivity for road users

Sensitivity of Receptor	Criteria for Road Users
High	Where the road is a minor rural road, not constructed to accommodate frequent use by HGVs. Includes roads with traffic control signals, waiting and loading restrictions, traffic calming measures.
Medium	Where the road is a local A or B class road, capable of regular use by HGV traffic. Includes roads where there is some traffic calming or traffic management measures.
Low	Where the road is Trunk or A-class, constructed to accommodate significant HGV composition. Includes roads with little or no traffic calming or traffic management measures.
Negligible	Where roads have no adjacent settlements. Includes new strategic trunk roads that would be little affected by additional traffic and suitable for Abnormal Loads and new strategic trunk road junctions capable of accommodating Abnormal Loads.

Table D24: Classification of receptor sensitivity for residents / locations

Sensitivity of Receptor	Criteria for Residents / Locations
High	Where a location is a large rural settlement containing a high number of community and public services and facilities.
Medium	Where a location is an intermediate sized rural settlement, containing some community or public facilities and services.
Low	Where a location is a small rural settlement, few community or public facilities or services.
Negligible	Where a location includes individual dwellings or scattered settlements with no facilities.

The IEMA guidance identifies the key impacts that are most important when assessing the magnitude of traffic impacts from an individual development. The impacts and levels of magnitude are discussed below:

- **Severance** – the IEMA guidance advises that, *"The Department for Transport has historically set out a range of indicators for determining the significance of severance. Changes in traffic flow of 30%, 60% and 90% are regarded as producing 'slight', 'moderate' and 'substantial' changes in severance respectively. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law. However, caution needs to be observed when applying these thresholds as very low baseline flows are unlikely to experience severance impacts even with high percentage changes in traffic."* (Para 3.16). The Guidelines acknowledge that changes in traffic flows should be used cautiously, stating that *"the assessment of severance should pay full regard to specific local conditions, e.g. sensitivity of adjacent land uses, prevalence of vulnerable people, whether or not crossing facilities are provided, traffic signal settings, etc."* (Para 3.17).
- **Driver delay** – the IEMA guidance notes that these delays are only likely to be *"significant when the traffic on the network surrounding the development is already at, or close to, the capacity of the system"* (Para 3.20).
- **Pedestrian delay (incorporating delay to all non-motorised users)** – the IEMA guidance advises that *"pedestrian delay and severance are closely related effects and can be grouped together. Changes in the volume, composition or speed of traffic may affect the ability of people to cross roads. In general, increases in traffic levels are likely to lead to greater increases in delay. Delays will also depend on the general level of pedestrian activity, visibility and general physical conditions of the development site."* (Para 3.24). Furthermore, the guidance advises that *"…it is not considered wise to set down definitive thresholds. Instead it is recommended that the competent traffic and movement expert use their judgement to determine whether pedestrian delay constitutes a significant effect."* (Para 3.26).
- **Non-motorised user amenity** - the IEMA guidance advises that, *"The 1993 Guidelines suggest that a tentative threshold for judging the significance of changes in pedestrian amenity would be where the traffic flow (or HGV component) is halved or doubled. Although these thresholds no longer appear in Department for Transport guidance, they have not been superseded by subsequent changes to guidance and are established through planning case law."* (Para 3.30).
- **Fear and intimidation** – there are no commonly agreed thresholds for estimating levels of fear and intimidation, from known traffic and physical conditions. However, as the impact is considered to be sensitive to traffic flow, changes in traffic flow of 30%, 60% and 90% are regarded as producing minor, moderate and substantial changes respectively in the IEMA guidance (Para

2.19). As such, this will be used to assess the potential impacts associated with construction activities around fear and intimidation on people in close proximity to the Proposed Development.

- **Road safety** – professional judgement will be used to assess the implications of local circumstances, or factors which may elevate or lessen risks of accidents. In line with the IEMA guidance, those areas of collision clusters will be subject to detailed review.
- **Road safety audits** – it would be proposed to undertake any necessary Road Safety Audits (RSA) post consent and it is considered that this can be secured via a DCO requirement.
- **Large loads** – the movement of the Abnormal Indivisible Loads (AILs) associated with the construction of the Proposed Development will be considered in full, within a separate route survey assessment, which will identify physical mitigation measures required to accommodate the predicted loads.

While not specifically identified, as a more vulnerable road user, cyclists are considered in similar terms to pedestrians.

The criteria to determine the significance of effects is presented in **Table D25** below.

Table D25: Significance of effects

Receptor Sensitivity	Magnitude of Change			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

Population

The significance of effects relating to Population will be assessed in line with Design Manual for Roads and Bridges; LA 112 Population and Human Health (2020) and professional judgement.

For impacts relating to Population, the receptors are users of the PRoW network within and around the Site and the criteria for determining the sensitivity of these receptors are detailed in **Table D26** below.

Table D26: Environmental value (sensitivity) and descriptions

Receptor value (sensitivity)	Description
Very High	1) National trails and routes likely to be used for both commuting and recreation that record frequent (daily) use. Such routes connect communities with employment land uses and other services with a direct and convenient walkers, cyclists and horse-riders route. Little/no potential for substitution. 2) Routes regularly used by vulnerable travellers such as the elderly, school children and people with disabilities, who could be disproportionately affected by small changes in the baseline due to potentially different needs. 3) Rights of way for walkers, cyclists and horse-riders crossing roads at grade with >16,000 vehicles per day.
High	1) Regional trails and routes (e.g. promoted circular walks) likely to be used for recreation and to a lesser extent commuting, that record frequent (daily) use. Limited potential for substitution; and/or 2) Rights of way for walkers, cyclists and horse-riders crossing roads at grade with >8,000 - 16,000 vehicles per day.
Medium	1) Public rights of way and other routes close to communities which are used for recreational purposes (e.g. dog walking), but for which alternative routes can be taken. These routes are likely to link to a wider network of routes to provide options for longer, recreational journeys; and/or 2) Rights of way for walkers, cyclists and horse-riders crossing roads at grade with >4000 – 8000 vehicles per day.
Low	1) Routes which have fallen into disuse through past severance or which are scarcely used because they do not currently offer a meaningful route for either utility or recreational purposes; and/or 2) Rights of way for walkers, cyclists and horse-riders crossing roads at grade with <4000 vehicles per day.
Negligible	N/A

The criteria for determining the magnitude of impact (change) likely to be experienced by receptors are detailed in **Table D27** below.

Table D27: Magnitude of impact and typical descriptions

Magnitude of impact (change)	Typical description
Major	>500 m increase (adverse) / decrease (beneficial) in walkers, cyclists and horse-riders journey length.
Moderate	>250 m – 500 m increase (adverse) or decrease (beneficial) in walkers, cyclists and horse-riders journey length.
Minor	>50 m – 250 m increase (adverse) or decrease (beneficial) in walkers, cyclists and horse-riders journey length.
Negligible	<50 m increase (adverse) or decrease (beneficial) in walkers, cyclists and horse-riders journey length.
No change	No loss or alteration of characteristics, features, elements or accessibility; no observable impact in either direction.

Taking the sensitivity of a receptor and the expected magnitude of impact (change) together will determine the likely significance of the effect. This significance matrix is shown in **Table D28** below.

Table D28: Significance of effects

Receptor Sensitivity	Magnitude of Change			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Negligible	Minor	Negligible	Negligible	Negligible

APPENDIX E
PROPOSED STRUCTURE OF THE ENVIRONMENTAL STATEMENT

Volume 1 – Non Technical Summary

Volume 2 – Main Environmental Statement

Introductory Chapters

Chapter 1: Introduction

Chapter 2: Description of the Proposed Development

Chapter 3: Reasonable Alternatives Considered

Chapter 4: Approach to EIA

Technical Chapters

Chapter 5: Air Quality

Chapter 6: Biodiversity

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Chapter 9: Landscape and Visual

Chapter 10: Land, Soils and Groundwater

Chapter 11: Noise and Vibration

Chapter 12: Transport and Access

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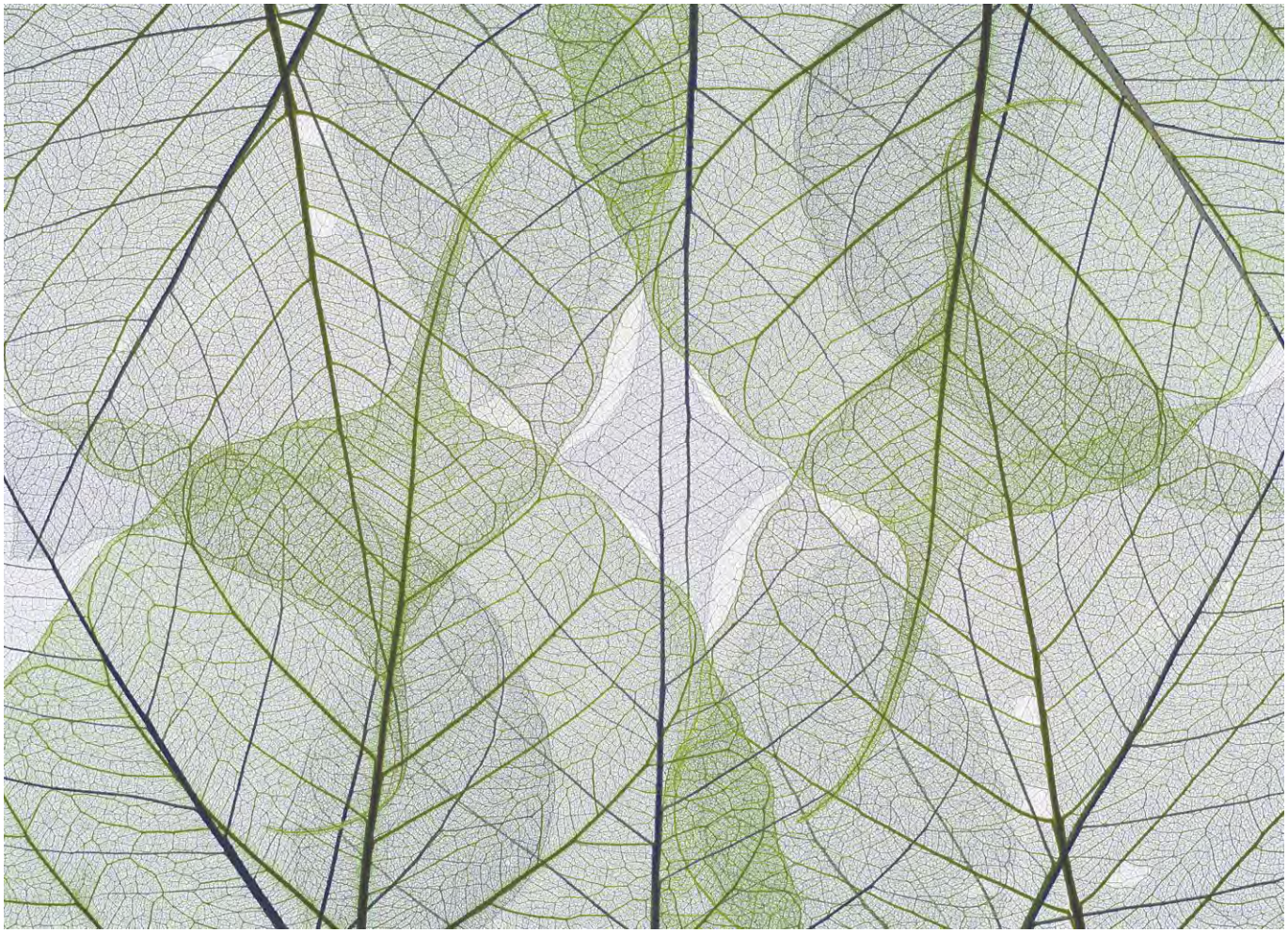
Concluding Chapters

Chapter 15: Summary of Effects

Volume 3 – Supporting Technical Appendices

Volume 4 – Supporting Figures and Plans

APPENDIX F
PRELIMINARY ECOLOGICAL APPRAISAL



JBM Solar Ltd

Peartree Hill Solar Farm

Preliminary Ecological Appraisal Report
Areas for Solar Development

2485116

RSK biocensus
EXPERTS IN ECOLOGY

OCTOBER 2023

RSK GENERAL NOTES

Project No.: 2485116

Title: Peartree Hill Solar Farm – Preliminary Ecological Appraisal Report

Client: JBM Solar Ltd

Date: October 2023

Office: Leeds

Status: Final

Author:	Ben Lappage	**Technical & Quality reviewer:**	Mark Lang
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EXECUTIVE SUMMARY

This report presents the results of a preliminary ecological appraisal (PEA) of a proposed large-scale solar farm at Peartree Hill Solar, east of Beverley, East Riding of Yorkshire (the Proposed Development). It also presents the results of surveys for Great Crested Newts (GCN) and a ground-level tree assessment (GLTA) for roosting bats. The surveys were carried out in June, August and September 2023 by RSK Biocensus on behalf of JBM Solar Ltd, part of RWE.

The appraisal was based on the red line boundary plan of the 'Site', though final site plans (including cable routes and access tracks) are yet to be confirmed. Therefore, the appraisal made here may need to be revised as more information regarding the Proposed Development footprint becomes available.

The *c.*1,300 ha Site comprises several smaller parcels of mostly arable land bordered by hedgerows, wet ditches and some small areas of woodland and lines of trees. All habitats and plants recorded on the Site are relatively common and widespread in the surrounding area. However, some woodland, the hedgerows and a single pond are all priority habitats listed under Section 41 of the NERC Act 2006 and will therefore be retained or enhanced where possible. This also applies to most of the wet ditches which have a similar value for wildlife. A landscape and ecological management plan (LEMP) will be produced for the Proposed Development to help ensure biodiversity net gain and improve the habitats on the Site for a range of species.

A Construction Environmental Management Plan (CEMP) will also be produced which includes best-practice construction methods to minimise potential impacts on protected species, retained habitats and nearby protected sites. Protected species to be contained within this plan will include reptiles and great crested newts (which are at most likely to have only a minimal presence on the Site), nesting/wintering birds, bats, badgers, otters and water voles.

A habitats regulations assessment (HRA) screening will be carried out due to the risk that the Proposed Development could affect qualifying species of wintering birds that use Hornsea Mere Special Protection Area (SPA) (*c.*5.8 km from the Site) and the Humber Estuary SPA and Ramsar Site (*c.*9.3 km from the Site). The CEMP should also include measures to minimise any potential impacts to a nearby site of special scientific interest (SSSI), namely Tophill Low SSSI, and some adjacent, ancient woodland – Cote Wood Local Wildlife Site (LWS). The Site also intersects many SSSI impact risk zones in the wider area, so the planning authority should consult with Natural England over the proposals.

Further surveys to inform the planning decision and any mitigation should include:

- Hedgerow surveys of any species-rich hedges likely to be affected (*c.*16 of *c.*150 hedgerows recorded on the Site). These can be undertaken from March-October.
- Updated surveys for breeding birds and wintering birds which should be carried out from March-July and October-March respectively – Wintering bird and breeding bird surveys have been completed by Avian Ecology Ltd.
- Bat activity surveys including three static deployments spread throughout April-October, these are being undertaken.
- Surveys on trees with bat roost potential where these are likely to be affected by the proposals. At least some of these surveys will need to be undertaken from May to August once any trees requiring removal are confirmed.

- A targeted survey for signs of badgers (ideally undertaken from autumn to spring).
- Surveys for water voles (and otters), where work will be taking place within 10 m of the banks of any of the ditches on Site, undertaken between mid-April and September once any ditch crossing points are confirmed.

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1.0 INTRODUCTION

1.1 Purpose of this report

1.1.1 This report presents the results of a preliminary ecological appraisal (PEA) comprising a background data search and habitat survey with assessment for protected or otherwise notable species, at the proposed Peartree Hill Solar site east of Beverley, East Riding of Yorkshire (centred on Ordnance Survey Grid Reference: TA 090 419). The survey area included the land within the red-line boundary (the Site), plus adjacent land up to 30 m where access permitted; the Site is shown in Figure 1. The report also includes the results of a ground-level assessment (GLTA) of trees with regard to their potential for supporting roosting bats and also surveys for great crested newts (*Triturus cristatus*; GCN) in the form of habitat suitability index (HSI) assessments and GCN environmental DNA (eDNA) surveys of ponds and ditches identified on or within 500 m of the Site.

1.1.2 The report identifies ecological constraints relevant to the Proposed Development, specifies any further survey or mitigation requirements (e.g. for any Ecological Impact Assessment), gives recommendations for avoidance and protection through design changes, and suggests opportunities for ecological enhancement, in particular to deliver biodiversity net gain.

1.1.3 The appraisal was carried out on behalf of JBM Solar Ltd, part of RWE.

1.2 Landscape context

1.2.1 The *c*.1,300 ha Site is located to the east of the town of Beverley, close to the hamlet of Meaux and villages of Routh, Leven and Long Riston. The Site comprises several smaller parcels of land (labelled Land Areas A to F), and each field is given a code (e.g. Field A1). Most of these areas are arable fields. However, there are also some fields of grazed grassland, and relatively small areas of neutral grassland, broadleaved woodland and scrub in some of these parcels. The fields are bordered by a mix of hedgerows, wet ditches and some of the many major, named drains and dikes in the area. The Site also comes close to the River Hull to the north-west.

1.2.2 The surrounding area is dominated by agricultural land, farmsteads and minor settlements with a complex network of drains and dikes. The main group of Land Area has few roads other than Meaux Lane which cuts through the centre of the area. However, the northernmost Land Area is separated from the others by the A1035 road, and the small, easternmost Land Area is separated from the rest of the parcels by this road and the adjoining A165. The River Hull runs close to the western edges of the Site, beyond which is the town of Beverley (*c*.1.3 km at its nearest point). The North Sea and the Humber Estuary each lie *c*.10 km to the east and south, respectively.

1.3 Development proposals

1.3.1 The Proposed Development is a large-scale ground mounted solar photo-voltaic (PV) installation. It is assumed that existing areas of woodland within the Site boundary are proposed to be retained, and some parts of the Site have been identified as possible

ecological mitigation/enhancement areas. Otherwise, it is assumed that most of the areas will have solar panels installed on them.

1.3.2 While it is anticipated that the majority of existing boundary habitats will be retained post-development, small sections of hedgerow and field margin may be affected during construction, particularly for facilitating access and cable routes. The locations of access tracks and cable routes is not yet known at the time of writing, though some estimations have been made on likely impacts.

2.0 METHODS

2.1 Overview

2.1.1 The PEA was undertaken in line with guidance from the Chartered Institute of Ecology and Environmental Management (CIEEM, 2017); it therefore included:

- a desk study (here called a background data search (BDS)), which included a review of aerial photographs; obtaining information from the DEFRA and JNCC websites, and the local authority website; requesting data from the local records centre; and
- a field survey that informed habitat mapping, an assessment of the possible presence of protected or priority species and the likely importance of habitat features.

2.1.2 The PEA report includes an ecological description of the Site and information about species that may occur there. Notes and mapping of any incidental sightings of invasive non-native plant species and protected or priority fauna species are also provided.

2.1.3 The surveys presented here were carried between June and September 2023 by suitably qualified RSK Biocensus ecologists, as per the following schedule:

- 1, 7 and 13 June 2023 – great crested newt (GCN) Habitat Suitability Index (HSI) and eDNA surveys.
- 8-22 August & 4 September 2023 – PEA and ground level tree assessment (GLTA).

2.1.4 The PEA was led by the senior ecological consultant Ben Lappage (BSc, MSc, MCIEEM) and the GCN surveys were led by the principal ecological consultant Lewis Wright (BSc, MCIEEM). Both are suitably qualified and experienced. At the time of writing, further surveys are planned or have already been undertaken but the results from these will be added to a single, updated report once they are complete.

2.2 Background data search

2.2.1 A search was made in July 2023 for relevant reference materials. A list of sources is given in Table 1.

Table 1. Data sources

Information obtained	Available from
Protected and noteworthy species-records	North & East Yorkshire Ecological Data Centre
Designated site locations and citations	Natural England website
Designated site locations and citations	Joint Nature Conservation Committee (JNCC) website
Designated site locations and citations	North & East Yorkshire Ecological Data Centre
Designations and legal protection of noteworthy species	Joint Nature Conservation Committee (JNCC) website
Areas / Habitats of Strategic Significance	https://www.eastriding.gov.uk/EasySiteWeb/GatewayLink.aspx?alId=105217

Information obtained	Available from
Areas / Habitats of Strategic Significance	National Habitat Networks https://www.data.gov.uk/dataset/0ef2ed26-2f04-4e0f-9493-ffbdbfaeb159/habitat-networks-england
Areas / Habitats of Strategic Significance	National Priority Focus Areas https://www.data.gov.uk/dataset/c20a40c5-c975-43e1-9abd-d1257aa58432/natural-england-national-priority-focus-areas
Areas / Habitats of Strategic Significance	Nature Improvement Areas https://www.data.gov.uk/dataset/a19c95e3-9657-457d-825e-3d2f3993b653/nature-improvement-areas
Aerial photography	As a viewer only, sources include: www.google.com; Google earth. Where reproduced as figures, sources vary and are licensed through ArcGIS, as stated.

2.2.2 A search was made for the following international designated sites of ecological importance within 10 km of the Site boundary: Ramsar sites, Special Areas of Conservation (SAC) and Special Protection Areas (SPA)[1]. For statutory sites such as Sites of Special Scientific Interest (SSSI), the search was within 2 km.

2.2.3 A search was also made for non-statutory designated sites and ancient woodlands (often important in a local context) within 1 km of the Site boundary.

2.2.4 The BDS also included a search for records within 1 km of the Site boundary of noteworthy species, which might pose a constraint to the proposed development. Species included in the search were:

- European protected species (listed on Schedules 2 and 5 of The Conservation of Habitats and Species Regulations 2017 (as amended));
- nationally protected species under Schedules 1, 5 and 8 of The Wildlife & Countryside Act 1981 (as amended) and The Protection of Badgers Act 1992;
- species listed as critically endangered, endangered or vulnerable based on the IUCN Red List Categories and Criteria 2001;
- all species listed on the RSPB's Birds of Conservation Concern 5 (Stanbury *et al.,* 2021) as red' or 'amber';
- nationally rare or nationally scarce species;
- notable[2] invertebrates; and
- species of principal importance listed under The Natural Environment and Rural Communities (NERC) Act 2006 or priority species under the relevant local biodiversity action plan (Nottinghamshire Biodiversity Action Group, 2020).

[1] SACs and SPAs were formerly called 'European Sites' and part of the Natura 2000 network; post-'Brexit', they are now considered part of the UK's 'national site network'. Ramsar sites are sites of international importance. See Appendix A for details. Note that SPAs, SACs and Ramsar sites are also underpinned by SSSI designations whose citations/boundaries may be slightly different.

[2] Appendix C includes a description of 'notable' as used in this context.

2.3 Plants and habitats

UKHab survey

2.3.1 The field survey was based on the UKHab survey methodology (UKHab Ltd, 2023). The UKHab classification system is the habitat classification that underpins the DEFRA Biodiversity Metric and is therefore the favoured habitat classification to use when surveys need to inform a Biodiversity Net Gain Calculation. This field survey was undertaken in line with CIEEM 2017 and involved the following elements:

- habitat mapping using a set of standard colour codes to indicate habitat types on a habitat map together with secondary codes that provide contextual information about the habitat (Figure 2); and
- a description of features of possible ecological or nature conservation interest in notes relating to numbered locations on the habitat map, called 'target notes'.

2.3.2 Vascular plant species were recorded during the survey, although no attempt was made to produce an exhaustive species list (additional species would almost certainly be found during more detailed surveys or repeat surveys at various times of the year).

2.3.3 Plant nomenclature in this report follows Stace (2021) for native and naturalised species of vascular plant, and mosses and liverworts follow Hill *et al*. (2008). Introduced species and garden varieties were identified using relevant Floras. Plant names in the text are given with common names with the scientific name (in italics) immediately following the first time it is mentioned.

Invasive non-native plant species (INNPS)

2.3.4 A UKHab survey does not involve exhaustive surveying for individual plant species, and various invasive species may be little in evidence at various times of year (depending on the species). A survey seeking to identify habitat types cannot therefore be relied upon to provide firm information about the presence or extent of INNPS. However, any such species that were encountered during the habitat survey would be noted, particularly Japanese Knotweed (*Reynoutria japonica*), Giant Hogweed (*Heracleum mantegazzianum*) and Himalayan Balsam (*Impatiens glandulifera*).

2.4 Protected and notable animals

General

2.4.1 The Site was assessed for its suitability to support protected or otherwise notable animals that are likely to occur in the area. Taking into account the results of the BDS, the geographic location, connectivity to natural habitats in the wider landscape, the nature and extent of habitats at the Site, and the Proposed Development, specific assessment was also carried out for the species/species groups outlined in the following sections.

Invertebrates

2.4.2 The Site was assessed for its suitability to support notable species and/or assemblage of invertebrates, but no specific surveys were undertaken. The habitat requirements of particular invertebrates are often species-specific, so consideration was given to the

presence of features and habitats that might be suitable for the notable species identified in the BDS.

Fish

2.4.3 Waterbodies/watercourses within/alongside the Site were broadly assessed for their likely habitat and water quality, and consequent suitability to support fish (and other species); however, no specific fish surveys were undertaken.

Great crested newts

2.4.4 Although standing water is essential for their breeding, great crested newts (*Triturus cristatus*) are terrestrial for most of the year and have been recorded up to 500 m from their breeding ponds. Ordnance Survey maps and aerial imagery was reviewed to identify any ponds within 500 m of the Site boundary, and the Site was assessed for its suitability for both terrestrial and breeding GCN. Optimal breeding ponds tend to be well-vegetated, relatively clean and unpolluted, free of fish and wildfowl, and retentive of water throughout most summers (but not necessarily all). Highly suitable terrestrial habitats include woodland, scrub and tussocky grassland, although GCN can be found in a broad range of sub-optimal habitats as well. Habitat suitability for other amphibians was similarly assessed.

Habitat Suitability Index (HSI)

2.4.5 The locations of ponds were identified using OS maps, aerial imagery and site visits. Their assessment of suitability for GCN was carried out using a Habitat Suitability Index (HSI) developed by Oldham et al. (2000). It is a numerical index, between 0 and 1, where 0 indicates unsuitable habitat and 1 represents optimal habitat.

2.4.6 There is a positive correlation between HSI scores and presence and abundance of GCN in ponds. Generally, ponds with high HSI scores are likely to support larger populations. However, the relationship is not sufficiently precise to conclude that a pond with a high HSI will definitely have a large newt population, or that a pond with a low HSI score will only have a small newt population or no newts at all.

Environmental DNA Sampling

2.4.7 Environmental DNA (eDNA) surveys for GCN were completed in addition to HSI assessments where ponds and ditches were identified as suitable for this sampling method. This requires a suitable depth of water of reasonable quality to allow sample extraction without undue disturbance to sediments or submerged vegetation which can lead to contamination of the sample resulting in indeterminate results.

2.4.8 eDNA sampling investigates whether GCN have been in a pond by analysing the water for their DNA (which can be shed in skin secretions, excrement, etc.). Using kits from approved suppliers, 20 samples were taken from each of the three ponds and eleven ditches using strict protocols (Biggs et al. 2014) approved by Natural England.

2.4.9 Subject to safety of access, sample spacing was regular, except in so far as it targeted aquatic vegetation that might be used for egg-laying. The 20 samples from a pond were finally collected into a single sample bag and gently homogenized, after which 6 sub-

samples were preserved in an ethanol-based preservative and sent to the ADAS laboratory for analysis.

Reptiles

2.4.10 The Site was assessed for its suitability for the four most widespread reptile species, with particular attention given to those features that provide suitable basking areas (*e.g.* south-facing slopes), hibernation sites (*e.g.* banks, walls, piles of rotting vegetation) and opportunities for foraging (*e.g.* rough grassland and scrub).

2.4.11 Specific habitat requirements differ between species. Common lizards (*Zootoca vivipara*) and slow-worms (*Anguis fragilis*) favour rough grassland. Grass snakes (*Natrix helvetica*) have broadly similar requirements, with a greater reliance on ponds and wetlands. Adders (*Vipera berus*) use a range of fairly open habitats with some cover but are most often found in dry heath.

Birds

2.4.12 Birds nest, forage and roost in a wide variety of habitats including scrub, woodland, hedgerows and trees, wetland, arable and pastoral farmland and rough grassland. Some species also use open bare ground and man-made structures.

2.4.13 The Site was assessed for its suitability to support diverse assemblages and/or uncommon species of breeding and non-breeding birds, with an emphasis on those species that are listed on Schedule 1 of the Wildlife & Countryside Act 1981 (as amended), the red and amber lists of the Birds of Conservation Concern 5 (Stanbury *et al.,* 2021) and other notable species recorded in the BDS, including any species that are qualifying features of nearby designated sites. Consideration was given to the Site's connectivity to landscape features that are likely to be of particular importance to birds, such as extensive areas of semi-natural woodland or wetlands. The presence of nests or signs of nest building were recorded, and buildings were surveyed for their suitability for barn owls and other species, with signs including nesting sites, feathers, droppings and pellets.

Bats

2.4.14 Habitats were assessed for their suitability for foraging and commuting bats, in line with guidance provided in Collins (2016). Areas of particular interest vary between species, but generally include sheltered areas and habitats with good numbers of insects, such as woodland, scrub, rivers and species-rich or rough grassland.

2.4.15 Trees and man-made structures were noted if they had potential suitability for roosting bats (Collins, 2016). This involved identifying features that roosting bats may favour (*e.g.* holes, cracks and cavities that might be used as bat access-points or roost sites).

Ground-level tree surveys

2.4.16 A targeted ground-level assessment of most individual trees was completed, with those recorded shown in Figure 4. However, large lines of trees or woodlands (unlikely to be significantly affected by the proposals) were assessed as a group. Features that might be used by roosting bats were described and categorised according to accepted guidelines

(Collins, 2016). Each tree was given a category during the ground-level surveys (see Table 2) based on its potential for roosting bats.

2.4.17 Trees may also be categorised as having *unknown potential* if the surveyor's view of the tree is obscured. This can be caused by dense Ivy (*Hedera helix*) covering the trunk and major limbs so as to conceal potential roosting features from view.

Table 2: Categorisation of the suitability of buildings or trees for roosting bats (Collins 2016)

Category (Potential to support roosting bats)	Description
Negligible suitability	Negligible habitat features on site likely to be used by roosting bats.
Low suitability	A structure with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity or hibernation). A tree of sufficient size and age to contain PRFs but with none seen from the ground or features seen with only very limited roosting potential.
Moderate suitability	A structure or tree with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely for a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High suitability	A structure or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.
Confirmed roost	Bats or evidence of bats recorded during the initial inspection surveys or during dusk/dawn surveys. A confirmed record (supplied by records centre/local bat group) would also apply.

Water voles and otters

2.4.18 Waterbodies and watercourses and their surrounding habitats were assessed to determine whether they were suitable for water voles (*Arvicola amphibius*). Suitable habitats include vegetated earth banks, reed beds, flowing water and wet ditches. Incidental signs of water vole activity, including burrows, feeding platforms, food remains and latrines, were recorded if they were encountered.

2.4.19 Waterbodies and watercourses on the Site were also assessed for their suitability for otters (*Lutra lutra*). Otters require clean rivers and associated waterbodies with an abundant, varied supply of food and plenty of bank-side vegetation, offering secluded sites for their holts. Other suitable habitats include reed beds and interconnected ditches and streams. Incidental signs of otter activity, including holts, foraging signs, paths (runs), footprints and spraints, were recorded if they were encountered.

Badgers

2.4.20 An assessment was carried out to identify areas that might be used by badgers (*Meles meles*) for foraging or sett building within 30 m of all areas potentially affected by works (where access was possible). The area was briefly searched for signs of badgers

including setts, foraging signs, paths (runs) and latrines where possible, and the category of sett and levels of activity visible at each sett was recorded.

Other species of Principal Importance

2.4.21 The UK countries of England, Wales, Scotland and Northern Ireland are obliged by their individual laws to maintain lists of species and habitats of principal importance for biodiversity conservation. In England, this obligation derives from the Natural Environment and Rural Communities (NERC) Act 2006. An assessment of the suitability and likelihood of the Site supporting such species was made (for example, hedgehog (*Erinaceus europaeus*)).

2.5 Constraints and limitations

2.5.1 The preliminary appraisal as to whether protected or otherwise notable species might occur on the Site is based on the suitability of habitat, the known distribution of relevant species in the local area (from online sources and desk study), and any signs of the relevant species. Field signs for protected and valuable species are also often difficult to find or are absent from a site. The survey does not therefore constitute a full and definitive survey of any protected species group.

2.5.2 All recommendations made in this report are based on the Proposed Site Layout Plan provided (JBM Solar Ltd, 2023). If the plans change significantly, then an ecologist must be consulted and further surveys may be required.

2.5.3 Due to access limitations and health and safety concerns, it was not possible to survey all ponds and ditches within the Site and surrounding 250 m buffer. However, this is not considered to be a major constraint to the overall results, as due to the spread of negative eDNA results across the site the likelihood of GCN being present on-site is considered to be low.

3.0 RESULTS

3.1 Background Data Search

Strategic Significance

Formal local biodiversity action plans and strategies

3.1.1 The East Riding of Yorkshire local biodiversity action plan lists the following habitats as local formal targets: rivers, standing open water and canals, ponds, arable farmland, hedgerows, traditional orchards, woodland, lowland heathland and acid grassland, chalk grassland, neutral grassland, coastal and floodplain grazing marsh, fen, marsh and swamp, reedbed, maritime cliff and slopes, and saline lagoons.

Informal strategies to identify ecologically desirable areas

3.1.2 The Site is not within a national priority focus area or nature improvement area. The Site is partially within three habitat network zones, comprising one 'Network Enhancement Zone 1' (Land connecting existing patches of primary and associated habitats which is likely to be suitable for creation of the primary habitat), one 'Network Enhancement Zones 2' (Land connecting existing patches of primary and associated habitats which is less likely to be suitable for creation of the primary habitat) and one Network Expansion Zone (NEZ; Land beyond the Network Enhancement Zones but with potential for expanding, linking/joining networks across the landscape).

3.1.3 The south-east corner of Area B6 is within a Network Enhancement Zone 1 due to the presence of a nearby orchard. The western side of Land Area A is within a Network Enhancement Zone 2 (due to the presence of rivers, floodplain grazing marsh and Tophill Low SSSI. The south-eastern side of Land Area A is within a NEZ associated with a large area of floodplain grazing marsh and lowland fen within a Habitat Restoration-Creation area. Actions in all these zones can be targeted to expand and improve connectivity between different patches of habitat (Natural England, 2020).

International statutory designated sites

3.1.4 There are five international statutory designated sites within 10 km of the Site boundary, all listed in Table 3 along with their proximity to the Site and a brief description of their reason for designation.

Table 3: International designated sites within 10 km of the Site boundary

Site Name	Designation	Distance (m) and orientation
Hornsea Mere	SPA	5,815 - E
Qualifying Features / Reason for Designation The only remaining mere in Holderness, Humberside and only major freshwater body for wintering ducks in a wide area. It consists of a large, shallow, eutrophic lake of 120 ha with associated fen, carr woodland and reedswamp. It is designated for regularly supporting internationally important wintering populations of gadwall (*Anas strepera*) and a nationally important population of mute swan (*Cygnus olor*). Wintering populations of goldeneye (*Bucephala clangula*), pochard (*Aythya farina*), shoveler (*Anas clypeata*) and tufted duck (*Aythya fuligula*) are also mentioned.		

Site Name	Designation	Distance (m) and orientation
Humber Estuary	SPA	9,330 - S
Qualifying Features / Reason for Designation The Humber Estuary is a large macro-tidal coastal plain estuary with high suspended sediment loads, which feed a dynamic and rapidly changing system of accreting and eroding intertidal and subtidal mudflats, sandflats, saltmarsh and reedbeds. The range of habitats on the Estuary support a large variety of wintering, passage and breeding birds, including internationally important populations of a number of species. Birds are widely distributed throughout the site. Adjacent inland terrestrial sites areas are used extensively as high tide roosts and also provide important supporting habitats for SPA bird species. The qualifying species are: Breeding and non-breeding: Great bittern (*Botaurus stellaris*), Pied avocet (*Recurvirostra avosetta*) Breeding: Eurasian marsh harrier (*Circus aeruginosus*), Little tern (*Sterna albifrons*) Non-breeding: Common shelduck (*Tadorna tadorna*), Hen harrier (*Circus cyaneus*), European golden plover (*Pluvialis apricaria*), Red knot (*Calidris canutus*), Dunlin (*Calidris alpina alpina*), Ruff (*Philomachus pugnax*), Black-tailed godwit (*Limosa limosa islandica*), Bar-tailed godwit (*Limosa lapponica*), Common redshank (*Tringa totanus*)		
Humber Estuary	Ramsar site	9,330 - S
Qualifying Features / Reason for Designation An estuary with a maximum 7.4 m tidal range exposing vast mud and sand flats at low tide. Vegetation includes extensive reedbeds, areas of mature and developing saltmarsh, backed by grazing marsh or low sand dunes with marshy slacks and brackish pools. The area regularly supports internationally important numbers of various species of breeding and wintering waterbirds. Many passage birds, notably internationally important populations of ringed plover (*Charadriu hiaticula*), and sanderling (*Caldris alba*) stage in the area. The site supports Britain's most southeasterly breeding colony of grey seal (*Halichoerus grypus*).		
Humber Estuary	SAC	9,330 - S
Qualifying Features / Reason for Designation The Humber Estuary is a large estuary with a high tidal range (macro-tidal). The high suspended sediment loads in the estuary feed a dynamic and rapidly changing system of accreting and eroding intertidal and sub-tidal mudflats and sandflats as well as saltmarsh and reedbeds. Other notable habitats include a range of sand dune types in the outer estuary, together with sub-tidal sandbanks and coastal lagoons. A number of developing managed realignment sites on the estuary also contribute to the wide variety of estuarine and wetland habitats. The estuary supports a full range of saline conditions from the open coast to the limit of saline intrusion. As salinity declines upstream tidal reedbeds and brackish saltmarsh communities fringe the estuary. Significant fish species include river lamprey (*Lampetra fluviatilis*) and sea lamprey (*Petromyzon marinus*) which migrate through the estuary to breed in the rivers of the Humber catchment. Grey seals come ashore in autumn to form large breeding colonies.		
Greater Wash	SPA	9,560 - E
Qualifying Features / Reason for Designation The Greater Wash SPA was designated in 2018 to protect important areas of sea used by waterbirds during the non-breeding period, and for foraging in the breeding season. This site is designated for three non-breeding species: red-throated diver (*Gavia stellata*), little gull (*Hydrocoloeus minutus*) and common scoter (*Melanitta nigra*). The SPA provides important habitat for these species including shallow sandbanks and other sandy substrates. This site is also designated for three breeding tern species: sandwich tern *(Sterna sandvicencis)*, little tern *(Sternula albifrons)* and common tern *(Sterna hirundo)*. During the breeding season populations of all three of these tern species forage within the Greater Wash SPA.		

National statutory designated sites

3.1.5 There are two national statutory designated sites within 2 km of the Site boundary, listed in Table 4 and shown in Figure 5.

Table 4: National designated sites within 2 km of the Site boundary

Site Name	Designation	Distance (m) and orientation
Tophill Low	SSSI	365 – N of northern parcel

Site Name	Designation	Distance (m) and orientation
Qualifying Features / Reason for Designation Tophill Low consists of two artificial storage reservoirs situated in the River Hull valley. The water stored in the reservoirs is abstracted from the adjacent River Hull and is ultimately used for public supply. The site is important as one of few inland standing open water bodies suitable for wintering wildfowl in North Humberside. The reservoirs support nationally important concentrations of Gadwall, Shoveler and Tufted Duck together with locally important populations of Goldeneye, Great Crested Grebe (*Podiceps cristatus*), Mallard (*Anas platyrhynchos*), Pochard, Teal (*Anas crecca*) and Wigeon (*Mareca Penelope*). The reservoirs also attract a wide range of other wildfowl species throughout the year, particularly during spring and autumn migration. The condition of the site is listed as 'favourable'.		
Leven Canal	SSSI	865 – S of northern parcel
Qualifying Features / Reason for Designation The 5 km length of the Leven Canal was cut in 1802 across the marshes and meres of the Hull valley. Following drainage of surrounding marshland it provided a refuge for wetland plants and now supports an important remnant of this once much more widespread vegetation. The Canal is fed by calcareous springs supplying water of a very high quality. The canal sides and banks show a zonation of emergent fen species, and there is a wide range of aquatic plant species. The condition of the site is listed as 'unfavourable – no change'.		

Non-Statutory Sites

3.1.6 There are seven non-statutory designated sites, all local wildlife sites (LWSs), within 1 km of the Site boundary (not including seven 'deleted LWSs' which are not listed here). The designated sites present within the study area are listed in Table 5 along with their proximity to the Site and a brief description of their reason for designation. Their locations are also shown in Figure 5.

Table 5: Non-statutory designated sites within 1 km of the Site boundary

Site Name	Designation	Distance (m) and orientation
Cote Wood	LWS	Borders the Site boundary
Qualifying Features / Reason for Designation Ancient, semi-nuatural woodland with Ash (*Fraxinus excelsior*), scattered old Pedunculate Oak (*Quercus robur*) and an area of ancient Hazel (*Corylus avellana*) coppice. Target Note 24.		
Meaux	LWS	35 - central
Qualifying Features / Reason for Designation A linear verge (semi-improved grassland) and a hedgerow of approximately 1500 m along the minor road between Wawne and Routh, adjacent to the remnant earthworks of Meaux Abbey. On the eastern side of the road, at the northern end, there is a small area of semi-natural broadleaved woodland, which is integral to the site.		
Tophill Low	LWS	60 - N
Qualifying Features / Reason for Designation As well as a range of habitats and good floristic diversity, the site is known to support great crested newts, grass snakes and otters. The site also supports a notable range of birds (See Tophill Low SSSI), bats and dragonflies.		
Arnold Drain	LWS	70 - SE
Qualifying Features / Reason for Designation An interesting road verge comprising a variety of species in an otherwise arable landscape.		
Watton Carr	LWS	125 - N
Qualifying Features / Reason for Designation This site is noted more for its ornithological interest (wetland site, open water) rather than its botanical interest, especially due to its proximity to Tophill Low Nature Reserve.		
Easingwold Farm	Historic LWS	525 - N
Qualifying Features / Reason for Designation		

Site Name	Designation	Distance (m) and orientation
A large area of wet grassland with substantial patches of rushes within it and a drain along the western boundary with a good aquatic flora.		
Figham Pastures	LWS	530 - W
Qualifying Features / Reason for Designation A good mixed habitat site containing higher floristic diversity in the drains and dykes that intersect the site. Comprises mosaics of semi-improved, neutral, cattle-grazed, pasture with marshy grassland, extensive areas of rush pasture, and two drainage systems running north-south through the site.		

Notable habitats

3.1.7 There is one area of ancient semi-natural woodland within 1 km of the Site boundary, namely Cote Wood (LWS) that is along the edge of Land Area D.

3.1.8 Other priority habitats which are ostensibly on or adjacent to the Site according to MAGIC maps (www.magic.defra.gov.uk) include areas of priority deciduous woodland (in Land Areas D and E) and areas of floodplain grazing marsh to the south-west of the Site (particularly Area E16, and also around Area E6, though the latter is clearly cropland).

SSSI impact risk zones

3.1.9 The Site intersects 30 SSSI Impact Risk Zone buffers (with constraints varying across the Site). The highest constraints area is that the planning authority is recommended to consult with Natural England for all planning applications. The Proposed Development is likely to submit a Development Consent Order (DCO) to the Planning Inspectorate rather than a planning application to the Local Planning Authority. Notwithstanding this, Natural England will be consulted.

Protected and Notable Species

3.1.10 There are records of at least 15 protected species within 1 km of the Site boundary (Table 7, Appendix C). These include great crested newt, grass snake, at least three species of bat, badger, otter, water vole and seven species of bird.

3.1.11 At least 67 additional noteworthy species are recorded from places within 1 km of the Site boundary (Table 8, Appendix C), of these:

- 2 are very common amphibians – common toad (*Bufo bufo*) and common frog (*Rana temporaria*);
- 20 are birds;
- 2 are fish – brown/sea trout (*Salmo trutta*) and European eel (*Anguilla anguilla*);
- 16 are invertebrates (all Lepidoptera);
- 3 are mammals – Brown hare, western European hedgehog and harvest mouse; and
- 24 are plants (almost half being aquatic/marginal species).

3.1.12 Noteworthy species include species of principal importance that are listed under Section 41 of The Natural Environment and Rural Communities (NERC) Act 2006. Those of relevance to the Site and the current proposals are discussed in Sections 4.2 and 4.3.

3.2 Plants and habitats

UKHab survey

3.2.1 The UKHab habitat map is provided as Figure 2 and shows the location of the target notes referred to in the text below. A full description for each of the target notes is given in Appendix A. The Site comprises the following habitats (with UKHab codes in brackets):

- Built linear features (u1e)
- Cropland (c1)
- modified grassland (g4)
- other neutral grassland (g3c)
- woodland (w)
- lines of trees (w1g6)
- hedgerows (h2)
- Dense scrub (h3)
- standing open water and ditches (r1g)
- reedbeds (f2e)

Built linear features (u1e)

3.2.2 There is usually at least one formal stone or metalled farm track within most of the parcels, though they are frequently muddy with patches of common weeds. Some of the areas also border Meaux Lane and Meaux Road (being either side of these roads in the case of Land Areas D and F).

Cropland (c1)

3.2.3 The vast majority of the Site is arable land which at the time of the survey was a mix of cereal crops, non-cereal crops (such as beans), and three temporary grass and clover leys. The leys were dominated by Perennial Rye-grass (*Lolium perenne*) and sometimes also included White Clover (*Trifolium repens*) or Timothy (*Phleum pratense*). As the fields were all intensively farmed, common arable weeds, where present, were mostly limited to the corners or very edges of the fields, with the exception of two small fields where saplings of a fir (*Abies* species) were being grown (Target Notes 13 and 32) and two fields which appeared to have been left fallow (Target Notes 12 and 22).

3.2.4 The most frequent weeds included Black-grass (*Alopecurus myosuroides*), Shepherd's-purse (*Capsella bursa-pastoris*), Common Poppy (*Papaver rhoeas*), Scentless Mayweed (*Tripleurospermum inodorum*), Common Field-speedwell (*Veronica persica*), Greater Plantain (*Plantago major*), Prickly Sow-thistle (*Sonchus asper*), Perennial Sow-thistle (*Sonchus arvensis*) and Cow Parsley (*Anthriscus sylvestris*). More rarely, Sun Spurge (*Euphorbia helioscopia*), Fool's Parsley (*Aethusa cynapium*) and Field Madder (*Sherardia arvensis*) were also found.

3.2.5 There were also six cultivated field margins, mainly towards the south of the Site. Most were dominated by Chicory (*Cichorium intybus*), though two had a mix of flowering

plants, sometimes including Chicory, but also Alsike Clover (*Trifolium hybridum*), White Clover (*Trifolium repens*), Red Clover (*Trifolium pratense*), Crimson Clover (*Trifolium incarnatum* ssp. *incarnatum*), Phacelia (*Phacelia tanacetifolia*), Cornflower (*Centaurea cyanus*), Sunflower (*Helianthus annuus*), Common Bird's-foot-trefoil (*Lotus corniculatus*) and Wild Carrot (*Daucus carota* ssp. *carota*). A number of ruderal weeds were also usually found in these areas, mainly Cock's-foot (*Dactylis glomerata*), Yorkshire-fog (*Holcus lanatus*), Prickly Sow-thistle (*Sonchus asper*), Redshank (*Persicaria maculosa*), Bristly Oxtongue (*Helminthotheca echioides*), Creeping Thistle (*Cirsium arvense*) and Perennial Sow-thistle (*Sonchus arvensis*). Only one of these margins was remotely species-rich (Target Note 21; Plate 1).

Plate 1. One of the field margins (Target Note 21).

Modified grassland (g4)

3.2.6 There are several fields of modified grassland around the Site. All are dominated by Perennial Rye-grass but they varied in species-richness. Some appeared to be grazed, long-term leys with few other species other than Shepherd's-purse, White Clover and Dandelion (*Taraxacum* agg). Others had a slightly greater diversity of species but had recently been cut for silage and also included Timothy, Yorkshire-fog, and a variety of weeds such as Creeping Thistle, Spear Thistle (*Cirsium vulgare*), Greater Plantain, Cock's-foot, and Broad-leaved Dock (*Rumex obtusifolius*).

3.2.7 However, at least two fields were slightly more diverse despite still being dominated by Perennial Rye-grass and other productive grasses. One included Common Bent (*Agrostis capillaris*) and Red Fescue (*Festuca rubra*) and the other (Target Note 8) had an area with up to eight or nine species/m^2. This area of the field frequently included Red Fescue and Meadow Buttercup (*Ranunculus acris*) but also less frequently, Lesser Trefoil (*Trifolium dubium*) and Common Sorrel (*Rumex acetosa*), with rarer Common Bird's-foot-trefoil (*Lotus corniculatus*), Meadow Vetchling (*Lathyrus pratensis*) and Lady's Bedstraw (*Galium verum*).

Plate 2. A less heavily improved area of modified grassland (Target Note 8).

3.2.8 All other areas of modified grassland are present as 2-4 m wide strips along the margins of fields and used as tracks for farm machinery. Perennial Rye-grass is usually dominant in these areas with other species dependent on the levels of mowing or disturbance. Shorter grassland frequently includes White Clover, Dandelion, Shepherd's-purse, Greater Plantain (*Plantago major*) and occasionally Red Bartsia (*Odontites vernus*). Longer grassland frequently includes Yorkshire-fog, Common Couch (*Elymus repens*), Cock's-foot, Soft-brome (*Bromus hordeaceus*), Common Nettle (*Urtica dioica*), Ribwort Plantain (*Plantago lanceolata*) and Hogweed (*Heracleum sphondylium*), the latter usually in areas where the grassland merges into neutral grassland dominated by False Oat-grass (*Arrhenatherum elatius*) that surrounds most ditches and hedges.

Other neutral grassland (g3c)

3.2.9 There are only three significant areas of neutral grassland on the Site, with most other areas found along the margins of fields along ditches and hedgerows.

3.2.10 One of the larger areas of grassland is a mosaic of species-poor grassland dominated by False Oat-grass with rank, weedy vegetation and patchy scrub with Hawthorn (*Crataegus monogyna*) and Grey Willow (*Salix cinerea*) (Target Note 1). The weedy vegetation is dominated by Common Nettle, Cleavers (*Galium aparine*) and Hemlock (*Conium maculatum*) with other species including Hogweed, Creeping Thistle and Common Reed (*Phragmites australis*).

3.2.11 Another area (Target Note 10) is a strip of sown grassland with abundant False Oat-grass, Crested Dog's-tail (*Cynosurus cristatus*), Creeping Thistle and Creeping Bent (*Agrostis stolonifera*). Yorkshire-fog, Common Knapweed (*Centaurea nigra*) and Lady's Bedstraw are all frequent.

Plate 3. Wide strip of sown, moderately species-rich grassland (Target Note 10).

3.2.12 The other area (Target Note 31) is a small field with tall, rank, species-poor grassland. The grassland appeared to be maintained for the pheasants which were being reared within an enclosure in the field. Cock's-foot is dominant with frequent species including Spear Thistle, Broad-leaved Dock and Common Ragwort. Reed Canary-grass (*Phalaris arundinacea*) and Chicory, present in the cultivated field margins, were also occasional in the grassland.

3.2.13 All of the other areas of neutral grassland are along the margins of fields, merging into ditches and hedgerows. Most are relatively narrow (2-4 m wide) and none were particularly species-rich (mostly around 4-9 species/m^2), generally being dominated by False Oat-grass and a few other very common grasses and forbs. Most appeared to be infrequently mown, though many have scattered scrub, mainly Bramble.

3.2.14 The most species-poor areas generally had a greater abundance of Common Couch, Creeping Thistle and Common Nettle. The less rank areas occasionally support species such as Common Knapweed, Meadow Vetchling, Tufted Vetch (*Vicia cracca*), and Crosswort (*Cruciata laevipes*). Much more rarely, and only on the banks of ditches, the grassland is more open and less species-poor with Fairy Flax (*Linum catharticum*) found in one area (Target Note 15). Frequently, species from the ditches also merge in with the surrounding grassland, mainly Common Reed, Reed Canary-grass and Great Willowherb (*Epilobium hirsutum*), though Purple Small-reed (*Calamagrostis canescens*) was found on the banks of some of the ditches to the south-east of Land Area A.

Woodland (w)

3.2.15 There are seven areas of woodland on the Site (Target Notes 3, 7, 11, 18-20 and 25). Most of these are not considered a habitat of principal importance listed under Section 41 of The Natural Environment and Rural Communities (NERC) Act 2006, mainly because they are either very young (e.g. Target Note 11), dominated by Sycamore (*Acer pseudoplatanus*) and other non-native species (e.g. Target Notes 3 and 19) or just very small areas in the corners of fields (e.g. Target Notes 7 and 25). One area (Target Note 20) does have a few mature Pedunculate Oak (*Quercus robur*) trees and semi-mature

Ash (*Fraxinus excelsior*), though the rest is dominated by young, planted trees. None of the areas have a species-rich ground flora, and it is usually dominated by a mix of Common Nettle, Cleavers, Ivy, and Hogweed. However, a few contain a small amount of False Brome (*Brachypodium sylvaticum*).

3.2.16 The only area of greater value (Target Note 18; Plate 4) is a small area of young to mature Pedunculate Oak and Ash woodland with an understorey of Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), a species of elm (*Ulmus* species) and saplings of Ash, Alder (*Alnus glutinosa*) and Horse-chestnut (*Aesculus hippocastanum*). Like the rest of the woodland, the ground flora is species poor, but it does include Lords-and-Ladies (*Arum maculatum*). The only nearby woodland of more value is the ancient woodland Cote Wood LWS (Target Note 24) which is adjacent to the Site, though at the other side of a ditch.

Plate 4. An area of woodland within the Site boundary (Target Note 18).

Lines of trees (w1g6)

3.2.17 Only six lines of trees were recorded across the Site. To the north of Land Area A is a line of mostly young to semi-mature Sycamore trees. To the north of Land Area E is a line of young poplar species (*Populus* cf. × *canadensis*). Along ditches in Land Area B and C are some young to mature Ash, Pedunculate Oak and Sessile Oak (*Quercus petraea*), and in Land Area B, there is a line of semi-mature Sycamores. However, also in Land Area B is the most significant line of trees with over 100 trees, some of them mature (Target Note 4; Plate 5). Species are mostly Ash and Pedunculate Oak with occasional Horse-chestnut.

3.2.18 The ground flora under all lines of trees was species-poor, usually with Common Nettle, Cleavers, Cow Parsley or grassland dominated by False Oat-grass.

Plate 5. A section of the longest line of trees on the Site (Target Note 4).

Hedgerows (h2)

3.2.19 Over 150 hedges have been recorded on the Site, and are found frequently across all parcels with the exception of Land Area A. Most are species-poor and are usually dominated by Hawthorn with other frequent species including Elder, Blackthorn (*Prunus spinosa*), species of elm (*Ulmus* spp.) and various species of rose (*Rosa* spp.). More occasional or rarely found species include Field Maple (*Acer campestre*), Wild Cherry (*Prunus avium*), Hazel, Grey Willow (*Salix cinerea*), Goat Willow (*Salix caprea*), Buckthorn (*Rhamnus catharticus*), Dogwood (*Cornus sanguinea*), Spindle (*Euonymus europaeus*) and Spurge-laurel (*Daphne laureola*). The ground flora is always relatively species-poor and usually dominated by a mix of Common Nettle (*Urtica dioica*), Cleavers (*Galium aparine*), Ivy (*Hedera helix*) or Bramble (*Rubus fruticosus* agg.). Ancient woodland indicators such as Lords-and-Ladies and Dog's Mercury (*Mercurialis perennis*) were only very rarely found.

3.2.20 Around a third of the hedgerows have wet ditches associated with them, often with some Great Willowherb, Common Reed or Reed Canary-grass. Over a third of the hedges also have trees which are mostly just young or semi-mature. Ash is the most common species, though Sycamore and Pedunculate Oak are also common. More rarely there are species such as Field Maple, Rowan (*Sorbus aucuparia*) and Alder (*Alnus glutinosa*).

3.2.21 Only 16 of the hedges were recorded as species-rich (which in this part of England means they have at least four native woody species per 30 m section). These species-rich hedges tend to be mix of Hawthorn and Blackthorn, usually also with Field Maple, but otherwise many of the same woody species are present. Almost all of the species-rich hedges are on boundaries of the Land Areas (e.g. Target Note 27), though two are internal hedges well within the Site boundary (Target Notes 23 and 28).

3.2.22 Many of the hedges are gappy, leggy, or overgrown but all qualify as habitats of principal importance.

Plate 6. One of the few species-rich hedges on the Site (Target Note 23).

Dense scrub (h3)

3.2.23 There are several relatively small areas of dense Bramble scrub, usually along banks of ditches and drains or in neglected corners of fields. They usually occur alongside species-poor grassland dominated by False Oat-grass with Common Nettle. Occasionally there are other woody species including Hawthorn, Grey Willow, Elder and young Ash trees. Other frequent forbs include Cleavers, Creeping Thistle, Great Willowherb, Rosebay Willowherb (*Chamaenerion angustifolium*) and Large Bindweed (*Calystegia silvatica*). There are also several similar areas of mixed scrub found in very similar situations, just with Hawthorn, Elder, Bramble and species of rose (*Rosa* species) having a more equal cover.

3.2.24 However, to the western side of Land Area G (Target Notes 29 and 30), there are also two larger, more significant areas of mixed scrub planted in the recent past for game cover. There is a wide range of mostly native, but also non-native woody species, and paths of mown, modified grassland cutting through the areas. Species include Bramble, Hawthorn, Blackthorn, Hazel, Rowan, Buckthorn, Guelder-rose (*Viburnum opulus*), Snowberry (*Symphoricarpos albus*) and Southern Dogwood (*Cornus sanguinea* ssp. *australis*).

Plate 7. One of the large areas of mixed, planted scrub to the west of Land Area F (Target Note 30).

Standing open water and ditches (r1g)

3.2.25 Only two ponds were recorded on the Site. One is a very minor, inaccessible, shallow pond within semi-mature woodland (Target Note 25) with the only aquatic vegetation being a species of Water-starwort (*Callitriche* sp.). The other is a more substantial, though still minor pond on the edge of Land Area G (Target Note 29; Plate 8) which is more likely to be considered a habitat of principal importance. The pond had abundant marginal vegetation with Reed Canary-grass, Bulrush and Reed Sweet-grass (*Glyceria maxima*).

Plate 8. The only substantial pond on the Site (Target Note 29).

3.2.26 In addition to these two ponds, *c*.60 wet ditches of various lengths, widths and depths were recorded across the Site. Most were relatively minor, though contained shallow water with abundant marginal vegetation, usually Reed Canary-grass and Great Willowherb, though Common Reed is most dominant in Land Area A to the north.

Occasional species across most ditches include Branched Bur-reed (*Sparganium erectum*), Meadowsweet (*Filipendula ulmaria*), Wild Angelica (*Angelica sylvestris*), Common Fleabane (*Pulicaria dysenterica*), Purple-loosestrife (*Lythrum salicaria*), Reed Sweet-grass (*Glyceria maxima*) and Soft-rush (*Juncus effusus*), with Bramble often shading some of the ditches.

3.2.27 Species encountered more rarely, usually in the less species-poor ditches (e.g. Target Note 2; Plate 9) included Water-plantain (*Alisma plantago-aquatica*), Broad-leaved Pondweed (*Potamogeton natans*), Greater Pond-sedge (*Carex riparia*), Water-cress (*Nasturtium officinale*), Water Figwort (*Scrophularia auriculata*), Yellow Loosestrife (*Lysimachia vulgaris*), Hemp-agrimony (*Eupatorium cannabinum*), Marsh Woundwort (*Stachys palustris*), Pink Water-speedwell (*Veronica* cf. *catenata*), Bulrush (*Typha latifolia*) and Sharp-flowered Rush (*Juncus* cf. *acutiflorus*). Rarely, Square-stalked St John's-wort (*Hypericum tetrapterum*) and Dewberry (*Rubus caesius*) were also found on the banks.

Plate 9. One of the less species-poor ditches on the Site (Target Note 2).

3.2.28 Aside from species of duckweed (*Lemna* sp.), there were no floating or submerged plants in the vast majority of the ditches. However, some of the more major ditches could not be assessed in detail as the surface of the water was several metres from the top of the banks. Furthermore, most of the larger ditches, drains and dikes are not on the Site but instead form the boundaries of the Site, including:

- Leven North Carr Drain and the northern end of Holderness Drain (to the south and east of Land Area A, respectively);
- Holderness Drain (to the north of Land Area F and south and west of Land Area D);
- Weel Stone Carr Drain (to the south of Land Areal E);
- Meaux and Routh East Drain and the Arnold West Carr Drain (both to the West of Parcels B and C);
- Routh and Meaux 'Road' (along the northern boundary of Area D7);
- Monk Dike (in between areas of Land Area B, though not on the Site itself); and

- the majority of a major drain (east of Land Areas B and C, later flowing into Land Area C, Target Note 6).

3.2.29 The only larger, named drains on the Site itself are Routh and Meaux Drain in Land Area D (Target Note 14), Meaux West Drain (a slightly smaller drain which crosses the Site in Land Area D; Target Note 26), and a large drain running through Land Area C (Target Note 6) into Drewery's Sock Dike which separates Area C7 from the rest of Land Area C.

Plate 10. One of the few major ditches within the Site boundary (Target Note 6).

Reedbed (f2e)

3.2.30 There are several areas mapped as reedbed, though none of these are substantial reedbeds that would classify as a habitat of principal importance. Almost all are along ditches to the south-east of Land Area A where aquatic marginal vegetation (f2d) dominated by Common Reed forms strips of reedbed over 5 m wide. There is only one other area of reedbed in a very small area around a dry pond, largely hidden behind Grey Willow and Bramble scrub (Target Note 17).

Invasive non-native plant species

3.2.31 No invasive species were identified on the Site. Small infestations could have been missed due to the broad scope of the PEA survey and dense vegetation along many of the ditches which would obscure many invasive aquatic species. However, it is highly unlikely that any non-native, invasive plant species will be present within working areas as these are mostly intensively managed arable fields.

3.3 Protected and notable animals

Invertebrates

3.3.1 The BDS returned records of 16 notable invertebrates within 1 km of the Site, all species of Lepidoptera (butterflies and moths). Most of the habitats present around the edges of the fields are considered likely to support a common assemblage of invertebrate species,

typical of neutral grassland, woodland and scrub, and shallow ditches. The more moderately species rich fallow fields and cultivated margins (e.g. Target Note 21) will also offer additional habitat for pollinating insects. However, it is considered unlikely that any rare invertebrate species rely on the Site.

Fish

3.3.2 While some of the ditches are wide, the channels of those actually on the Site (rather than the larger ones bordering the Site) are always relatively narrow, usually with very shallow water. Even the largest ditches are therefore unlikely to support many species of fish. Fish are therefore not considered further in this report.

Great crested newts

3.3.3 There are records of GCN within 1 km of the Site. Habitats within the Site, including rough grassland field margins, patches of scrub and woodland, also provide suitable terrestrial habitat for GCN. The network of hedgerows and ditches also serve as potential corridors to allow movement and dispersal of GCN. However, the large expenses of frequently disturbed and intensively managed arable cropland offer poor quality terrestrial habitat for GCN and it is unlikely that they would be found in such areas. Therefore within the majority of the working areas the risk of GCN presence is likely to be very low.

3.3.4 A total of six ponds within a 500 m radius of the Site were identified that could provide potential breeding habitat for GCN. Four of these were accessible to survey, and three of were suitable for eDNA testing.

3.3.5 A total of 11 ditches were deemed suitable for eDNA sampling, the remaining ditches were assessed as unsuitable either due to water quality or lack of safe access to the water's edge for surveying purposes. Due to the number of ditches across this Site, only the ditches that were suitable for eDNA testing have been included within the table. It is also worth noting that some ditches to the east of Land Area A were surveyed as they were within the Site boundary at the time of the surveys, but are no longer included. The results have been retained as they provide useful information on the potential presence/ absence of GCN in Land Area A.

3.3.6 Three of the four ponds that were accessible to survey were suitable for eDNA sampling. The results of these eDNA tests and HSI assessments, along with the results from the ditches are within Table 6, Figure 3, and the full eDNA reports within Appendix E.

Table 6: HSI and eDNA summary

Reference	OS Grid Reference	HSI score	Suitability	eDNA
Ditches				
Ditch 1 Arnold and Riston Drain	53.875254, -0.315068	N/A	-	Negative
Ditch 2	53.875978, -0.315543	N/A	-	Negative
Ditch 101	53.900828, -0.359100	N/A	-	Indeterminate – white precipitate
Ditch 102	53.906196, -0.374570	N/A	-	Indeterminate – low sediment
Ditch 103 Holderness Drain North	53.907628, -0.357435	N/A	-	Indeterminate – white precipitate
Ditch 104	53.894393, -0.348871	N/A	-	Negative
Ditch 105	53.889745, -0.347888	N/A	-	Negative

Reference	OS Grid Reference	HSI score	Suitability	eDNA
Ditch 106	53.897670, -0.355050	N/A	-	Indeterminate – white precipitate
Ditch 107	53.848349, -0.355347	N/A	-	Negative
Routh and Meaux Drain	53.855044, -0.356885	N/A	-	Negative
Ditch B	53.852589, -0.361494	N/A	-	Negative – low sediment
Ponds				
Pond A	53.831236, -0.346762	0.644	Average	Negative
Pond B	53.829770, -0.338367	0.629	Average	Negative – low sediment
Pond 1	53.873856, -0.312396	0.512	Below average	Not suitable for the use of eDNA (Very polluted irrigation pool)
Pond 2	53.850614, -0.336385	0.326	Poor	Negative – low sediment

3.3.7 All three ponds that were tested returned negative eDNA results. While this is not proof of the absence of GCN, it does indicate that they are likely to be absent, or only present so rarely as to be undetectable. It is therefore determined that no further presence/absence or population class-size assessment surveys are required for these ponds.

3.3.8 Seven of the eleven ditches that were tested returned negative eDNA results, with the remaining four returning indeterminate results due to poor water quality within the samples collected. Due to the spread of negative eDNA results across the Site, the likelihood of GCN being present on site is considered to be low.

3.3.9 The majority of the remaining ditches on Site were considered unsuitable, either because they were completely or almost entirely dry or due to them having flowing water, sufficient to deter GCN from using them for breeding purposes. It its therefore considered likely that GCN will be absent from the ditches on Site.

Reptiles

3.3.10 There are records of grass snakes within 1 km of the Site and while the majority of the Site is dominated by frequently disturbed arable cropland much of the habitat is more suitable. Examples of suitable habitats include areas of rough grassland (Target Notes 10 and 31), hedgerows, wet ditches and rough grassland and scrub along field boundaries. The ditches in particular offer suitable habitat for grass snakes, with basking sites, foraging opportunities and usually some nearby woodland or abandoned corners of fields which offer potential hibernation opportunities.

3.3.11 It is therefore assumed that reptiles (mainly grass snakes) could be present in some areas of the Site, however they will mainly be closely associated with boundary features rather than within the fields themselves and are likely to only be present at relatively low density. They are therefore unlikely to be negatively affected by the proposals, except potentially during construction.

Birds

3.3.12 The BDS returned records of 7 protected and 20 other notable bird species from within 1 km of the Site. The Site supports a variety of habitats including arable crop fields, improved and unimproved grass margins, hedgerows, ditches which often form thin strips of reedbed, patches of scrub, individual trees and several areas of woodland of varying size, which are suitable for supporting varied assemblage of bird species. Breeding bird surveys carried out in 2022 (Avian Ecology 2023) suggest most breeding territories

across the Site will be Skylark (*Alauda arvensis*) within the fields and other species including wrens (*Troglodytes troglodytes*), whitethroat (*Sylvia communis*), yellowhammer (*Emberiza citrinella*) and reed bunting (*Emberiza schoeniclus*) in hedges and ditches around the Site.

3.3.13 One of the most likely protected bird species to be present on the Site is probably barn owl, with potential nesting locations within nearby farmsteads and two barn owl boxes found on the boundaries of the Site (Target Notes 5 and 9), one of which showed evidence of use. However, no trees or boxes where barn owls could nest were recorded in the centre of the Site. Also, other species such as Cetti's warbler (*Cettia cetti*) could nest on the Site, and a previous bird survey on the area in 2022 (Avian Ecology 2023) found nesting little ringed plover (*Charadrius dubius*) in Field A6.

3.3.14 Perhaps more crucially, the large fields also have the potential to support large numbers of wintering birds which use nearby protected sites, particularly along the east coast and Humber Estuary. Surveys in 2022/2023 (Avian Ecology 2023) recorded 800 Golden Plover in Field F15, a qualifying species for Humber Estuary SPA.

Bats

3.3.15 The BDS only returned records of a few bat species from within 1 km of the Site – Common pipistrelle (*Pipistrellus pipistrellus*), Brown long-eared bat (*Plecotus auritus*) and whiskered bat (*Myotis mystacinus*). Most of the habitat, dominated by arable fields offers little suitability for foraging and commuting bats. However, the network of hedgerows and ditches with occasional areas of woodland are likely to serve as commuting and foraging corridors for common, widespread species of bats in the area. The majority of bat activity on-site is therefore likely restricted to boundary features and the scattered areas of woodland across the Site.

3.3.16 There were no buildings or structures suitable for roosting bats within the Site boundary, though 54 trees (or groups of trees) were individually assessed and found to have at least some roosting potential for bats (Table 10, Appendix H; Figure 4); this equates to at least 70 individual trees. Additionally, there were also several large groups of trees (mostly woodland, either within the Site on the site boundary) which have potential for roosting bats but were not assessed individually due to the large number and expanse of trees present (e.g. Target Notes 4, 16, 18, 20 and 24).

3.3.17 Most of the trees that were assessed were Ash and Pedunculate Oak but also rarely included Alder, Beech, and two dead trees – a species of willow (*Salix* species) and an unidentified species. Of the more than 70 trees recorded, at least 18 were classed as having low potential for roosting bats, at least 51 were classed as having moderate potential, and only one tree (an Ash tree close to Target Note 4) was classed as having high potential (Plate 11). However, since it is assumed that most trees will not require removal under the current proposals, few or no bat roosts are anticipated to be destroyed and require mitigation as a result of the works.

Plate 11. The only tree on the Site recorded as having high potential for roosting bats (close to Target Note 4, Land Area B1).

Water voles

3.3.18 The BDS returned records of water vole from within 100 m of the ite (though there are no records since 2006). The Site contains a network of ditches, some of which were noted as being potentially suitable for water vole, comprising banks with soft substrate suitable for burrowing and emergent vegetation for foraging. However, the majority of ditches, particularly on the Site, only had quite shallow water at the time of the survey and no immediate evidence of water voles such as burrows, latrines or feeding remains were noted. It is possible that water voles may be present on the Site within areas of suitable habitat though it is highly unlikely that the Site supports a significant population.

Otters

3.3.19 The BDS also returned records of otters from within 100 m of the Site, though there are no records later than 2005. While scrub on some of the very major ditches on the Site boundary may offer suitable resting or lying up sites for otters, no spraints or other evidence of otters was found. However, owing to the density of the vegetation in places and the lack of a detailed survey of ditches, it is possible that field signs may have been missed as they could not be searched for effectively. All but the major ditches (mainly around the boundaries of the site) lack sufficient depth or permanency of water to be particularly suitable for otters, and most of the Site itself offers little suitable cover for lying up or potential holt locations.

3.3.20 It is possible that otters may be present within or close to the Site, but it is considered unlikely that they would be present on the Site, other than perhaps if commuting through it along the larger networks of ditches.

Badgers

3.3.21 The BDS returned two records of badgers, one within 100 m of the Site, most recently in 2011. Despite some areas of woodland and banks suitable for burrowing, almost no evidence of badger activity was recorded across the Site, with the exception of a possible outlier sett on the banks of the Arnold and Rishton Drain in Land Area C (Target Note 6). However, a more detailed, targeted survey at a better time of year may find additional evidence. It is therefore likely that badgers use at least some of the Site, though conflict between badgers and the proposals are likely to be very minimal, especially as any setts are likely to be far from working areas and potential disturbance.

Other species

Western European hedgehog

3.3.22 There is one record of hedgehog from within 1 km of the Site (from 2000). Woodland, scrub, hedgerows and grass field margins on the Site provide suitable foraging habitat for hedgehogs, though some of the ditches may act as barriers to their dispersal between the few areas of suitable habitat that exist on the Site. There may be opportunities for hedgehogs to hibernate in the few dense areas of scrub and woodland on-site and also within suitably dense cover at the base of hedgerows. It is therefore considered possible that hedgehogs are present on the Site.

3.3.23 Brown hare (*Lepus europaeus*) favour a mosaic of arable fields, grassland and woodland edges. The Site provides suitable habitat for brown hares, though few sightings of this species were noted during the survey. There is one record of brown hare from within 1 km of the Site, in 2000.

3.3.24 There are two old records of harvest mouse (*Micromys minutus*) from 1985, and while most of the Site is unsuitable, it is possible that they are present within the less frequently disturbed margins of fields.

4.0 DISCUSSION

4.1 Proposals

4.1.1 The Proposed Development are currently at the design stage and final site plans (including cable routes and access tracks) have still to be confirmed. Therefore, the recommendations made here may need to be revised as more information regarding the project becomes available. This is particularly the case as some of the main impacts to biodiversity will be to boundary habitats rather than the panel areas within existing arable fields, and it is not yet possible to quantify exactly where or how significant these impacts will be.

4.2 Designated Sites

Internationally designated sites

4.2.1 The internationally designated sites within 10 km of the Site are all too far from the Site to be directly affected by the proposals, which means the Humber Estuary SAC and the habitats for which it is designated will not be affected. Furthermore, the Greater Wash SPA is designated mainly for birds which are unlikely to use the Site. However, the other three sites (Hornsea Mere SPA and the Humber Estuary SPA and Ramsar Site) are partly designated for birds that may use the large fields on the site over winter (such as golden plover). As there is some potential for significant adverse effects on these designated sites, a habitats regulations assessment (HRA) screening should be carried out for the Proposed Development.

Statutory designated sites

4.2.2 The two nearby national designated sites (Tophill Low SSSI and Leven Canal SSSI) are both unlikely to be directly affected by the Proposed Development. This is particularly the case for Leven Canal SSSI which is over 800 m away from the Land Areas and is mainly designated for the wetland vegetation that it supports. There is some potential for disturbance of birds using Tophill Low SSSI, particularly if they use the fields on the Site. However, habitats on the Site are far less suitable for wildfowl than those around the SSSI and in the wider area, so they are not likely to use the site frequently. Furthermore, the nearest part of the site (Land Area A) site is at the other side of the River Hull (and the substantial river embankment), reducing the potential disturbance of birds during construction. Therefore, no significant adverse effects are anticipated on these designated sites, especially if suitable measures to reduce disturbance are outlined in a Construction Environmental Management Plan (CEMP).

Sites of Special Scientific Interest (SSSI) - Impact Risk Zones

4.2.3 Although no impacts on SSSIs are anticipated, the Site does intersect many SSSI impact risk zones in the wider area, and it is therefore recommended that Natural England are consulted over the proposals.

Non-statutory designated sites

4.2.4 The seven non-statutory sites within 1 km of the Site are all local wildlife sites (LWSs). Most of these sites are unlikely to be directly affected by the Proposed Development due to their distance from the Site and low sensitivity of the habitats (e.g. some are road verges that will be regularly subject to pollution and disturbance from vehicles and agricultural operations). The only possible impacts will be the disturbance of birds that use some of the sites (as well as the nearby Tophill Low SSSI), though such disturbance is likely to be minimal compared to existing disturbance from farm machinery, and the disturbance will only be during construction rather than operation.

4.2.5 However, Cote Wood LWS does border the Site (Target Note 24) and so measures will need to be put in place to avoid pollution of the woodland, particularly during construction. With a CEMP in place, outlining measures to monitor and control potential pollution, there is no reason that the proposals will have negative impact on any of the LWSs.

4.3 Habitats and plants

Habitats

4.3.1 Some of the woodland, all of the hedgerows and a pond on the Site (Target Note 29) are all habitats of principal importance listed under Section 41 of the NERC Act 2006 and should therefore be retained or enhanced where possible. Also, most of the wet ditches have at least an equal value to these habitats. It is assumed the pond, and all woodland will be retained by the Proposed Development. Where it is not possible to avoid sections of hedgerows and ditches being affected for access tracks and cables, the width of these impacts should be minimised, and tracks and cables should be sited away from the more sensitive areas (i.e. trees within hedgerows and the wetter sections of ditches). A CEMP should be produced for the Site including best practice construction methods to minimise potential impacts on protected retained habitats (and also protected species). This should include measures to minimise working areas to avoid the unnecessary removal/alteration and disturbance of habitats, and measures to avoid/minimise generation of additional noise, light and any other pollution.

4.3.2 Furthermore, any species-rich hedgerow that is due to have sections removed (whether permanently or temporarily) should be subject to further hedgerow survey to assess its ecological importance under the Hedgerows Regulations 1997, as well as to help inform mitigation and enhancement. Survey should be undertaken any time from March to October (though April to August would be the most optimal). It is recommended that they do not take place until the final proposals are known, so that the hedgerows can be assessed with confidence about which sections, if any, will be affected.

4.3.3 Despite the presence of these priority habitats, all habitats on the Site are common and widespread in the surrounding landscape, and the vast majority of the footprint of the proposals is within intensively managed arable fields with negligible botanical value.

Plant species

4.3.4 While some of the ditches have a variety of aquatic species, none of the plant species identified during the survey are rare, all being listed as 'least concern' on the England red list (Stroh *et al*. 2014). Also, no locally scarce species were identified and all of the less common plants (or axiophytes) such as Water-plantain, Broad-leaved Pondweed, Purple Small-reed, Fairy Flax, Purple-loosestrife and Marsh Woundwort, are reportedly frequent or common in the River Hull valley (Crackles 1990). Additionally, none of the rarer species such as Tubular Water-dropwort (*Oenanthe fistulosa*) or Flowering-rush (*Butomus umbellatus*) which have been found on the nearby Leven Canal SSSI were identified on the Site. Since all of the less common plant species that are present on the Site are also all restricted to ditches, hedges and woodlands, outside of the proposed panel areas, they should not be significantly affected by the proposals.

Non-native, invasive plant species

4.3.5 As no invasive species were identified on the Site, it is unlikely that any significant populations exist on the Site. Plant and materials brought onto the Site should be free from any seeds or material from invasive plant species. If any invasive species are found, works should stop in the area and an ecologist should be contacted.

Biodiversity net gain

4.3.6 It should be relatively simple to enhance the habitats on the Site to meet any requirement for biodiversity net gain. Enhancement measures should be included in a landscape and ecological management plan (LEMP), and are likely to include:

- the creation of mitigation areas in strategic locations (particularly within or close to the network expansion and enhancement zones in Land Area A);
- the creation of more species-rich grassland habitats under solar panels within areas that are currently arable land (and rarely, species-poor grassland);
- the enhancement of hedges around the Site which are gappy or otherwise in poor condition by planting a range of suitable, native woody species and managing them appropriately;
- the enhancement of species-poor improved grass field margins; and
- the continuing management of ditches including control of scrub to prevent drying and succession to increasingly dense scrub.

4.3.7 While it may may only be possible to maintain, rather than significantly and reliably enhance many of the ditches and their banks, it may be that the cessation of agriculture adjacent to the ditches and enhancement of riparian buffers may lead to some improvements in water quality, provided they are safeguarded from any other forms of pollution.

4.4 Protected and other notable species

Invertebrates

4.4.1 The Proposed Development comprises almost entirely of arable crop fields, with such areas considered unlikely to support a particularly diverse assemblage of invertebrates. No further surveys for invertebrates are recommended. However, perimeter habitats which offer the greatest suitability for invertebrates should be retained, enhanced and protected from damage.

4.4.2 Areas around and beneath the solar panels may be enhanced for invertebrates by sowing a mix of native wildflowers and grasses and managing these in a sympathetic manner, reducing frequency of management in line with requirements to maintain site access and safety. This offers the opportunity to significantly enhance the sites value for invertebrates, since these new habitats would replace frequently disturbed and intensively managed cultivated ground which offers little value to most invertebrate species.

4.4.3 Creating substantial enhancements for invertebrates may also be particularly useful to compensate for any unexpected impacts on invertebrates, such as the panels acting as sensory traps (Szabadi *et al.*, 2023).

Great crested newts

4.4.4 As comprehensive surveys of all ditches and ponds in the area could not be completed, it is not possible to state with much confidence that GCN are absent from the Site. However, the results of surveys on ditches and ponds do clearly suggest that they are likely to be absent from most if not all of the Site. If GCN are present on the Site, they are unlikely to be directly affected by the proposals aside from through potential crossings of ditches and hedges for cable routes and access tracks, and also any large-scale management works of marginal habitats such as rough grassland. Following precautions set out for reptiles in the following section will help to minimise the risk of individual GCN being affected if present.

Reptiles

4.4.5 It is unlikely that reptiles are present on the Site at a high density and if any are present (most likely grass snakes), they will be largely restricted to boundary habitats, outside of the main working areas. Further surveys to confirm the presence or likely absence of reptiles are therefore not considered necessary in this instance; however, all species of reptiles in the UK are afforded protection through domestic legislation (refer to Appendix B) and precautionary measures are required during construction to prevent the killing or injuring reptiles, in the event that low numbers are present on-site during the works.

4.4.6 Any significant vegetation clearance or groundworks within suitable reptile habitat must follow a precautionary approach laid out in a CEMP to avoid killing or injuring reptiles. A precautionary approach usually includes clearance of vegetation in two stages to allow any reptiles present to move away: careful removal of scrub and rough grassland to 15 cm in order to make it unattractive to reptiles, and a second cut following after a minimum of 24 hours. Likewise, heaps of stored materials and waste may provide refugia and should be removed by

hand under the supervision of an ecological clerk of works (ECoW), ideally when reptiles (and GCN) are most active (April-September).

Birds

4.4.7 Due to the habitat suitability, records of notable species on the Site, and the possibility of the proposals affecting species that use nearby protected sites, an updated breeding bird survey and wintering bird survey is recommended to be carried out on-site. These surveys will help to inform the best locations and forms of mitigation and compensatory habitat for birds.

Bats

Roosts

4.4.8 As there are a large number of trees on-site with potential for roosting bats but very few are likely to be affected, it will be prudent to wait until the details of the proposals are known and it is clear which trees, if any, need to be removed or pruned. Once this is known, ecologists should be provided with these plans so they can carry out a desk-based review and work out which trees will need further survey (either because they have been recorded to have significant potential for roosting bats, or where there is not sufficient information). Further surveys would be carried out in the form of close-up aerial (climbed) inspections and/or emergence surveys. If roosting bats are present, there may be a need to obtain a licence from Natural England for those works to proceed, which could result in a delay to the proposed works.

4.4.9 The CEMP should also outline measures to avoid the disturbance of potential roosts that are not being directly affected by the works, but could be affected indirectly (e.g. by light pollution). Where trees with bat potential are located in the centre of fields (*i.e.* Field D18), measures may also be needed to ensure there are bat-friendly routes from these trees to the surrounding habitat.

Bat habitat

4.4.10 The Site is considered to offer moderate value for foraging bats, with key areas being boundary features such as hedgerows, ditches, scrub and areas of woodland. Lighting of the Site during both construction and operation will need to be given careful consideration, and in particular should aim to maintain dark corridors for bats to commute and forage using these important features. Reference should be made to the relevant guidance from the Institute of Lighting Professionals (ILP).

4.4.11 Recent research (Szabadi *et al*., 2023) indicates that solar farms may have detrimental impacts upon both invertebrates and bats. Whilst the study found general levels of activity on solar farms to remain broadly similar as other open habitats such as arable fields and grasslands, species composition appeared to differ, with species which tend to avoid more urban environments such Barbastelle (*Barbastella Barbastellus*) and *Myotis* spp. detected less frequently on solar farms than in other habitats.

4.4.12 Bat activity surveys are therefore recommended to determine the species diversity of the Site and how the landscape scale changes associated with the proposals may affect both foraging and commuting bats. Since there will likely be a requirement to remove sections

of hedgerow to facilitate site access, it will be important to determine if these alterations could disrupt potentially important bat commuting routes across the Site. The bat activity surveys will involve seasonal deployments of static bat detectors across the site, including a minimum of three deployments spread throughout the period April-October.

Water vole

4.4.13 The majority of the ditches on the Site offer some low suitability for water voles, and they could therefore be present in many of the ditches. While the vast majority of ditches on the Site are not expected to be directly impacted, if any work will be taking place within a ditch or within 10 m of its banks, for example any crossing points for cable routes or site access, then further specific water vole surveys will be needed to determine presence/likely absence of this species.

4.4.14 Surveys should comprise two visits between mid-April and September. Two visits are necessary due to the fact that habitat suitability for water voles can change significantly throughout the course of the breeding season, impacting apparent distribution and population size (Dean *et al.* 2016). The first visit should be completed between mid-April and the end of June and the second between July and September inclusive, with visits spaced at least two months apart. Survey findings would support development of appropriate mitigation and determine the need for work to be completed under licence.

Otters

4.4.15 As it is possible that otters may use the larger network of ditches that run through and around the Site, any works proposed within 30 m of the banks of major ditches should be subject to a more detailed survey to ensure there are no otter resting places which could potentially be subject to disturbance as a result of the work. This assessment could be made alongside the surveys for water voles.

4.4.16 If any otter resting places or holts were identified in proximity to proposed working areas, further assessment of the activity and the likely associated level of disturbance would be required. All otter resting places even when not in use are still legally protected and if removal of such a resting place was required to facilitate the work an EPS licence would be required.

Badgers

4.4.17 As badgers are likely to be present in at least some areas of the Site, a more detailed, targeted survey at a better time of year (i.e. late autumn to early spring) should be completed to assess the likelihood of affecting badger setts. If the presence of badgers on the Site is as limited as the preliminary assessment suggests, very little mitigation will be required, and it may be possible to carry out work in the area with a suitable buffer (e.g. 30 m) from any holes or minor setts.

4.4.18 A repeat pre-construction badger survey in areas found to contain badger setts should be completed no longer than six months prior to the planned start date of construction in case new setts are created. Appropriate precautionary measures to reduce potential disturbance or harm to badgers during construction can be outlined within the site CEMP.

4.4.19 If any works are to be conducted within 30 m of a recorded badger sett, further measures to prevent damage to the sett or disturbance of badgers within the sett may be required. This would involve monitoring, and potentially the exclusion of badgers from the sett under a licence from Natural England. Sett closures under licence from Natural England may only be undertaken during the period (July to November inclusive). Licence applications once received by Natural England typically take up to 30 days to process before the licence is issued. Dependent upon the size and status of the sett the licence may require that a suitable artificial sett be constructed prior to closure of the existing sett.

Other species

4.4.20 The CEMP should list measures to reduce potential impacts to other species such as hedgehogs and brown hares. Such measures may involve minor restrictions and ecological supervision where any potential nesting or resting sites such as log piles need to be removed.

4.5 Validity of Data

4.5.1 Unless the Site changes significantly, the surveys carried out for this report should remain valid for at least 18 months (CIEEM 2019).

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FIGURES

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Wilfholme
Baswick
Brandesburton
Hainsworth Park Golf Course
Aike
Beverley Airfield
A165
Sigglesthorne
Catwick
Leven
A165
Arram
B1243
Hornsea Road
Routh
Long Riston
Rise
Tickton
Grange Way
B1230
A1174
Beverley
Weel
Meaux
Skirlaugh
Hull Road
A164
Woodmansey
Hull Road
A165

Legend:

Site boundary

Rev	Date	Description	Drn	Chk	App
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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 1:

Site Location Plan

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447700 447600 447500 447400 447300 447200 447100 447000 446900 446800

16, 10 TN01

10

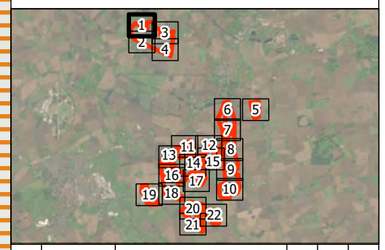
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Cereal crops
- Other neutral grassland
- Ditches
- Line of trees - associated with bank or ditch
- Target notes
- Secondary codes



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Peartree Solar Farm

RSK biocensus
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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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506200 506300 506400 506500 506600 506700 506800 506900 507000 507100 507200 507300

446900 446800 446700 446600 446500 446400 446300 446200 446100 446000

10 10 115

Legend:

Site boundary

UKHab Classification

Cereal crops

Modified grassland

Other neutral grassland

Reedbeds

Ditches

Secondary codes

Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

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Peartree Solar Farm

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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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507300 507400 507500 507600 507700 507800 507900 508000 508100 508200 508300 508400

447300 447200 447100 447000 446900 446800 446700 446600 446500

115 10 115 64 16 10

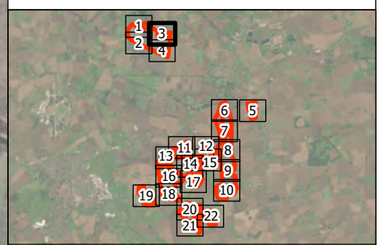
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Cereal crops
- Modified grassland
- Other neutral grassland
- Reedbeds
- Developed land; sealed surface
- Ditches
- Line of trees - associated with bank or ditch
- Native hedgerow
- Secondary codes



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Peartree Solar Farm

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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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446600 446500 446400 446300 446200 446100 446000 445900 445800 445700

115 115 10 TN02

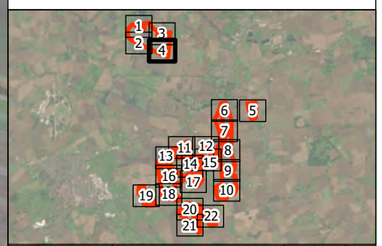
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Cereal crops
- Modified grassland
- Other neutral grassland
- Reedbeds
- Ditches
- Target notes
- Secondary codes



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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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511500 511600 511700 511800 511900 512000 512100 512200 512300 512400 512500 512600

443800 443700 443600 443500 443400 443300 443200 443100 443000 442900

73

115

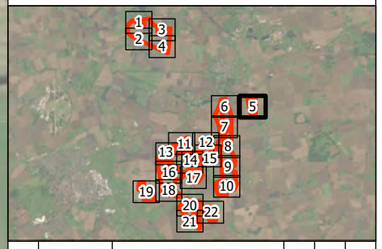
Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Cereal crops
- Modified grassland
- Other neutral grassland
- Ditches
- Native hedgerow
- Native hedgerow with trees
- Rural tree
- Secondary codes

Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch



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Peartree Solar Farm

RSK biocensus
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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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443800 443700 443600 443500 443400 443300 443200 443100 443000 442900

TN03

TN04

64

115

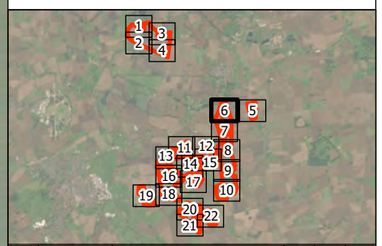
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Cereal crops
- Modified grassland
- Building
- Developed land; sealed surface
- Other woodland; broadleaved
- Ditches
- Ecologically valuable line of trees
- Fence
- Rural tree
- Target notes
- Secondary codes



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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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442900 442800 442700 442600 442500 442400 442300 442200 442100 442000

76

TN05

64, 10

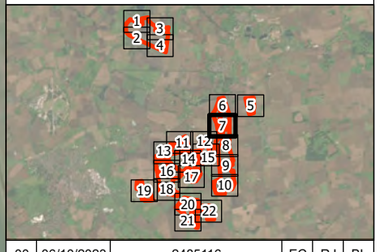
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Cereal crops
- Modified grassland
- Other neutral grassland
- Ditches
- Ecologically valuable line of trees
- Fence
- Line of trees - associated with bank or ditch
- Native hedgerow
- Rural tree
- Target notes
- Secondary codes



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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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442000 441900 441800 441700 441600 441500 441400 441300 441200 441100

74

64, 10

115

64

64

64, 10

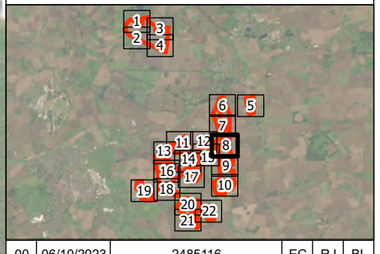
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Cropland
- Cereal crops
- Modified grassland
- Other neutral grassland
- Ditches
- Line of trees - associated with bank or ditch
- Native hedgerow
- Native hedgerow with trees - associated with bank or ditch
- Rural tree
- Secondary codes



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0 40 80 120
Metres
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510300 510400 510500 510600 510700 510800 510900 511000 511100 511200 511300 511400

441000 440900 440800 440700 440600 440500 440400 440300 440200

74 115 74 115 74 115 10 TN06 11

Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Arable field margins cultivated annually
- Cropland
- Cereal crops
- Bramble scrub
- Hawthorn scrub
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees - associated with bank or ditch
- Rural tree
- Target notes
- Secondary codes

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22

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Metres
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440100 440000 439900 439800 439700 439600 439500 439400 439300

TN07 TN08

16 115 16 10 115 16 11 16 115 111 10

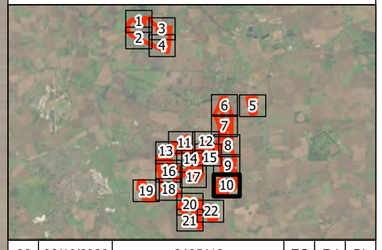
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Temporary grass and clover leys
- Arable field margins cultivated annually
- Cereal crops
- Bramble scrub
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Built linear features
- Other woodland; broadleaved
- Ditches
- Line of trees
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees
- Native hedgerow with trees - associated with bank or ditch
- Target notes
- Secondary codes



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0 40 80 120
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442100 442000 441900 441800 441700 441600 441500 441400 441300 441200

TN13

TN14

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Horticulture
- Cereal crops
- Modified grassland
- Other neutral grassland
- Ditches
- Line of trees
- Native hedgerow - associated with bank or ditch
- Target notes

Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

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0 40 80 120
Metres
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442100 442000 441900 441800 441700 441600 441500 441400 441300 441200

TN09

TN10 56 TN11

64

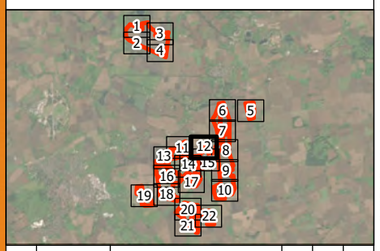
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Cropland
- Cereal crops
- Modified grassland
- Other neutral grassland
- Other woodland; broadleaved
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Species-rich native hedgerow
- Target notes
- Secondary codes



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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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441600 441500 441400 441300 441200 441100 441000 440900 440800

TN13

TN14

TN15

115

10

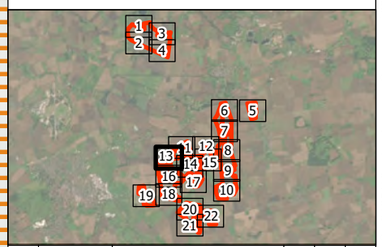
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Horticulture
- Cereal crops
- Modified grassland
- Other neutral grassland
- Built linear features
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees
- Species-rich native hedgerow with trees
- Target notes
- Secondary codes



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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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441200 441100 441000 440900 440800 440700 440600 440500 440400

TN14 TN15 TN17 TN18 TN19 TN21 TN22 TN23 TN24 TN25

115 10 16 77 11

Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Arable field margins pollen and nectar
- Cropland
- Cereal crops
- Bramble scrub
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Ponds (non-priority habitat)
- Reedbeds
- Built linear features
- Lowland mixed deciduous woodland
- Other woodland; broadleaved
- Other woodland; mixed
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees
- Native hedgerow with trees - associated with bank or ditch
- Species-rich native hedgerow
- Species-rich native hedgerow with trees
- Target notes
- Secondary codes

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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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441500 441400 441300 441200 441100 441000 440900 440800 440700

TN10 56 TN11 64 TN12 77 64, 10 10 115 10 11 TN24 TN25

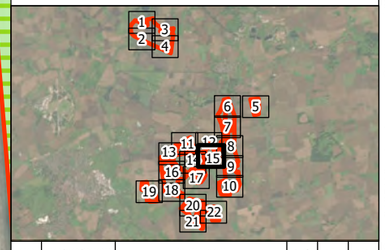
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Cropland
- Cereal crops
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Ponds (non-priority habitat)
- Built linear features
- Other woodland; broadleaved
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees - associated with bank or ditch
- Species-rich native hedgerow
- Species-rich native hedgerow with trees
- Rural tree
- Target notes
- Secondary codes



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0 40 80 120
Metres
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440800 440700 440600 440500 440400 440300 440200 440100 440000 439900

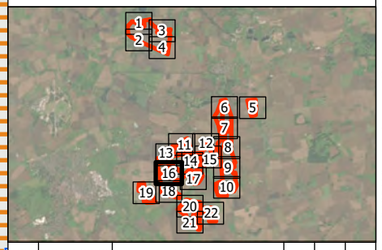
TN16 115 115 115 115 10 115 10 TN18 16 16 16 TN17 115 TN26 10 115

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Cereal crops
- Bramble scrub
- Modified grassland
- Other neutral grassland
- Reedbeds
- Built linear features
- Lowland mixed deciduous woodland
- Other woodland; mixed
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees
- Native hedgerow with trees - associated with bank or ditch
- Species-rich native hedgerow with trees
- Target notes
- Secondary codes



Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

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Metres
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440500 440400 440300 440200 440100 440000 439900 439800 439700

TN21
TN20
115
115
115
10, 115
10
115
10
11
10

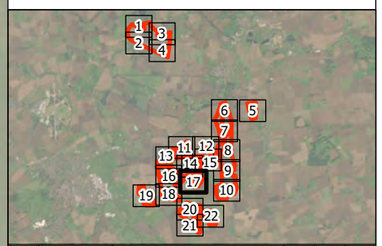
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Arable field margins pollen and nectar
- Cropland
- Cereal crops
- Bramble scrub
- Modified grassland
- Other neutral grassland
- Built linear features
- Other woodland; mixed
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees
- Native hedgerow with trees - associated with bank or ditch
- Species-rich native hedgerow with trees
- Rural tree
- Target notes
- Secondary codes



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00	06/10/2023	2485116	EC	RJ	BL

Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 2:

UKHab Habitat Survey
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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

N W E S

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Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 2 - UKHab.aprx

507600 507700 507800 507900 508000 508100 508200 508300 508400 508500 508600 508700

439900 439800 439700 439600 439500 439400 439300 439200 439100

TN27

115

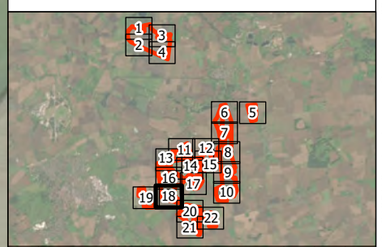
Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Cereal crops
- Modified grassland
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Species-rich native hedgerow with trees
- Target notes
- Secondary codes

Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch



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00	06/10/2023	2485116	EC	RJ	BL

Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 2:

UKHab Habitat Survey
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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

N W E S

REV 00

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439900 439800 439700 439600 439500 439400 439300 439200 439100 439000

TN28

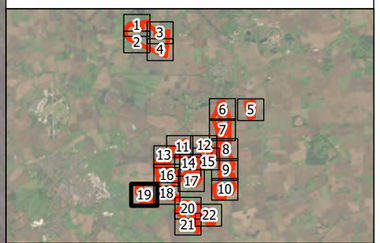
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Temporary grass and clover leys
- Cropland
- Modified grassland
- Other neutral grassland
- Ditches
- Fence
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees
- Species-rich native hedgerow
- Species-rich native hedgerow with trees
- Target notes



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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 2:

UKHab Habitat Survey
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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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439300 439200 439100 439000 438900 438800 438700 438600 438500 438400

TN30 TN31 TN29

10 115 115 115 10 10

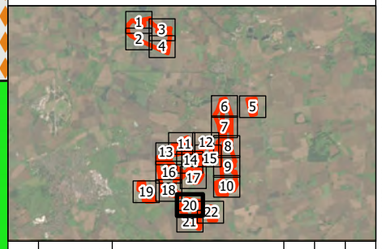
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Arable field margins game bird mix
- Horticulture
- Cereal crops
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Ponds (priority habitat)
- Built linear features
- Ditches
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees
- Species-rich native hedgerow with trees
- Rural tree
- Target notes
- Secondary codes



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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 2:

UKHab Habitat Survey
Page 20 of 22

0 40 80 120
Metres
SCALE: 1:3,500 @ A3

N W E S

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508600 508700 508800 508900 509000 509100 509200 509300 509400 509500 509600 509700

438500 438400 438300 438200 438100 438000 437900 437800 437700

TN29

10

10

10

TN33

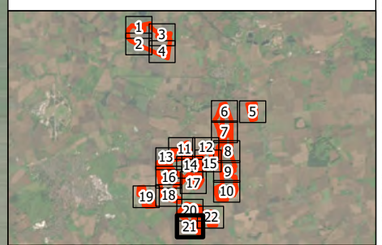
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Cereal crops
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Ponds (priority habitat)
- Built linear features
- Ditches
- Native hedgerow
- Native hedgerow with trees
- Species-rich native hedgerow with trees
- Rural tree
- Target notes
- Secondary codes



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Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 2:

UKHab Habitat Survey
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0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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438900 438800 438700 438600 438500 438400 438300 438200 438100

TN32

115

10, 16, 11

11

191

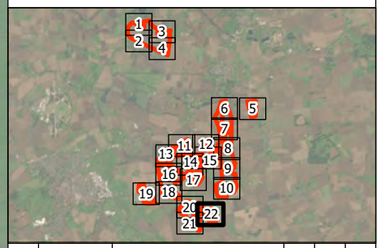
Secondary Codes	
10 - Scattered scrub	74 - Ploughed
11 - Scattered trees	76 - Recent management
16 - Tall herb	77 - Neglected
56 - Young trees - planted	111 - Road
64 - Mown	115 - Track
73 - Bare ground	191 - Ditch

Legend:

- Site boundary

UKHab Classification

- Non-cereal crops
- Horticulture
- Cereal crops
- Mixed scrub
- Modified grassland
- Other neutral grassland
- Built linear features
- Fence
- Native hedgerow
- Native hedgerow - associated with bank or ditch
- Native hedgerow with trees
- Target notes
- Secondary codes



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Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 2:

UKHab Habitat Survey
Page 22 of 22

0 40 80 120
Metres
SCALE: 1:3,500 @ A3

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506200 506400 506600 506800 507000 507200 507400 507600 507800 508000 508200 508400 508600

447600 447400 447200 447000 446800 446600 446400 446200 446000 445800 445600

Ditch 102

Ditch 102

Ditch 103

Ditch 101

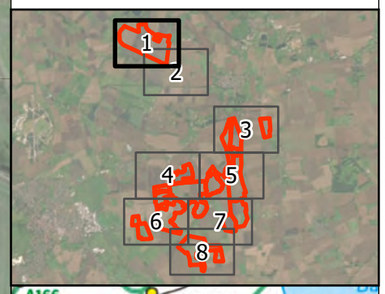
Ditch 106

Legend:

- Site boundary
- Surveyed watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative
- Indeterminate



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Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 3:

GCN Pond and Ditch Survey Results
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0 100 200 300
Metres
SCALE: 1:8,000 @ A3

N W E S

REV 00

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507200 507400 507600 507800 508000 508200 508400 508600 508800 509000 509200 509400 509600 509800

446600 446400 446200 446000 445800 445600 445400 445200 445000 444800 444600

Ditch 101

Ditch 106

Ditch 104

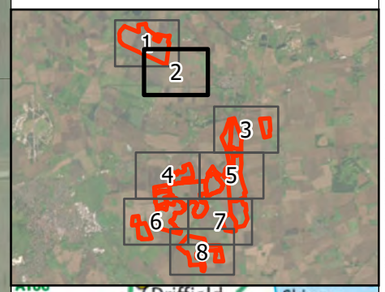
Ditch 105

Legend:

- Site boundary
- Surveyed watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative
- Indeterminate



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Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 3:

GCN Pond and Ditch Survey Results
Page 2 of 8

0 100 200 300

Metres

SCALE: 1:8,000 @ A3

N W E S

REV 00

Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 3 - GCN.aprx

510000 510200 510400 510600 510800 511000 511200 511400 511600 511800 512000 512200 512400

444200 444000 443800 443600 443400 443200 443000 442800 442600 442400 442200

Ditch 2

Ditch 1

Ditch 1

Pond 1

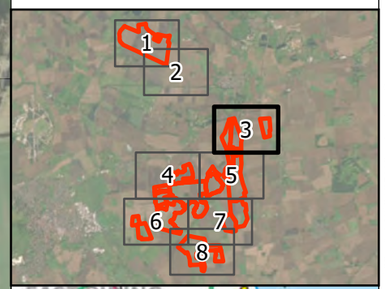
Ditch 1

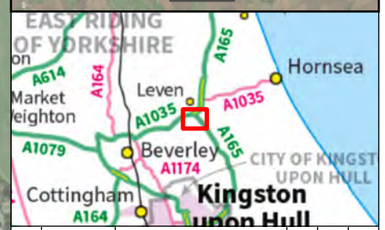
Legend:

- Site boundary
- Surveyed watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative
- Indeterminate





Rev	Date	Description	Drn	Chk	App
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Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 3:

GCN Pond and Ditch Survey Results
Page 3 of 8

0 100 200 300
Metres
SCALE: 1:8,000 @ A3

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442400 442200 442000 441800 441600 441400 441200 441000 440800 440600 440400

Routh &
Meaux
Drain

Ditch B

Ditch B

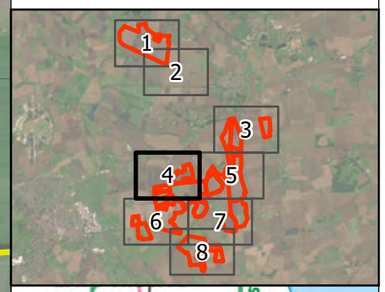
Ditch 107

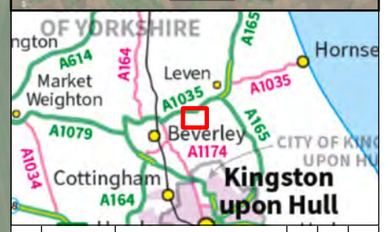
Legend:

- Site boundary
- Surveyed watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative
- Indeterminate





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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 3:

GCN Pond and Ditch Survey Results
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0 100 200 300
Metres
SCALE: 1:8,000 @ A3

N W E S

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442400 442200 442000 441800 441600 441400 441200 441000 440800 440600 440400

Ditch 1

Ditch 1

Routh &
Meaux
Drain

Pond 2

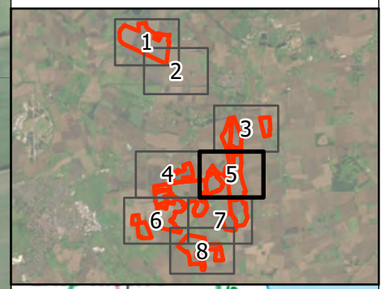
Ditch 1

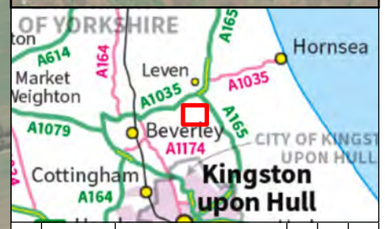
Legend:

- Site boundary
- Surveyed watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative
- Indeterminate





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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 3:

GCN Pond and Ditch Survey Results
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0 100 200 300
Metres
SCALE: 1:8,000 @ A3

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440600 440400 440200 440000 439800 439600 439400 439200 439000 438800 438600

Ditch B

Routh & Meaux Drain

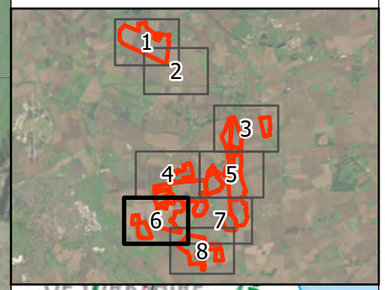
Ditch 107

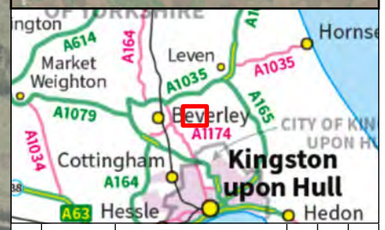
Legend:

- Site boundary
- Surveyed watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative
- Indeterminate





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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 3:

GCN Pond and Ditch Survey Results
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0 100 200 300
Metres
SCALE: 1:8,000 @ A3

N W E S

REV 00

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440600 440400 440200 440000 439800 439600 439400 439200 439000 438800 438600

Pond 2

Ditch 1

Ditch 1

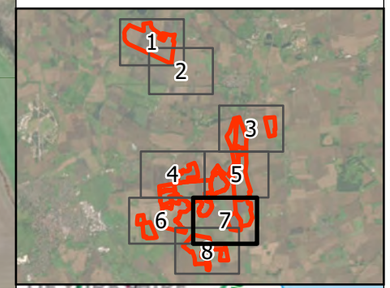
Ditch 1

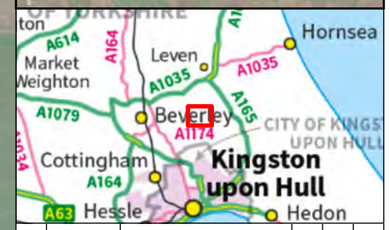
Legend:

- Site boundary
- Surveyed watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

- Negative
- Indeterminate





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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 3:

GCN Pond and Ditch Survey Results
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0 100 200 300
Metres
SCALE: 1:8,000 @ A3

N W E S

REV 00

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439600 439400 439200 439000 438800 438600 438400 438200 438000 437800 437600

Pond A

Pond B

Legend:

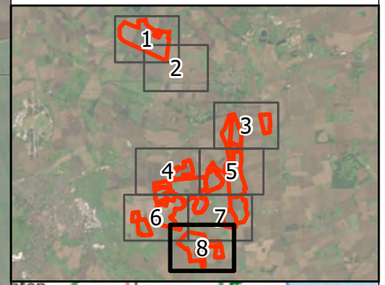
Site boundary

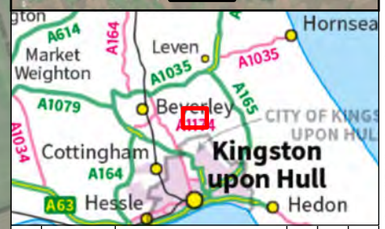
Surveyed watercourses and waterbodies - no eDNA survey

eDNA Surveyed Watercourses and Waterbodies Results

Negative

Indeterminate





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Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 3:

GCN Pond and Ditch Survey Results
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0 100 200 300
Metres
SCALE: 1:8,000 @ A3

N W E S

REV 00

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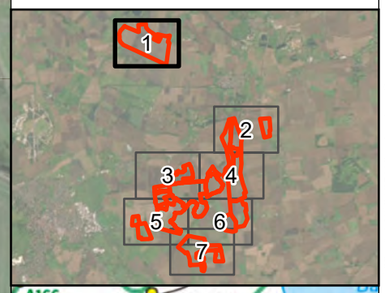
447600 447400 447200 447000 446800 446600 446400 446200 446000 445800 445600

Legend:

Site boundary

Overall Tree Suitability

- High
- Moderate
- Low



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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 4:

Ground Level Tree Assessment Results
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0 100 200 300
Metres
SCALE: 1:8,000 @ A3

N W E S

REV 00

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510000 510200 510400 510600 510800 511000 511200 511400 511600 511800 512000 512200 512400

444200 444000 443800 443600 443400 443200 443000 442800 442600 442400 442200

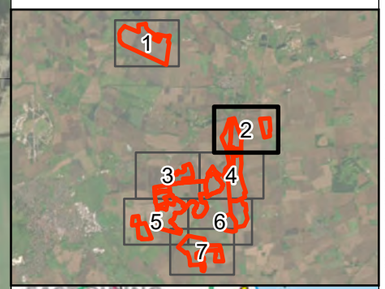
T1 T2 T3 T4 T5 T6 T7 T8

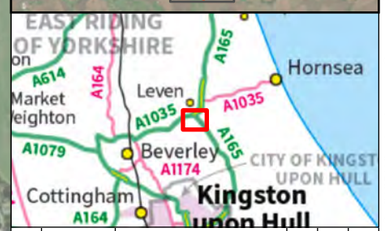
Legend:

Site boundary

Overall Tree Suitability

- High
- Moderate
- Low





Rev	Date	Description	Drn	Chk	App
00	04/10/2023	2485116	EC	RH	BL

Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 4:

Ground Level Tree Assessment Results
Page 2 of 7

0 100 200 300
Metres
SCALE: 1:8,000 @ A3

N W E S

REV 00

Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 4 - GLTA.aprx

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442400 442200 442000 441800 441600 441400 441200 441000 440800 440600 440400

T10 T11 T12 T13 T14 T15 T16 T17 T18

Legend:

Site boundary

Overall Tree Suitability

- High
- Moderate
- Low

1 2 3 4 5 6 7

OF YORKSHIRE
Market Weighton
Leven
Hornse
Beverley
Cottingham
Kingston upon Hull
A614 A164 A165 A1035 A1079 A1174 A1034

Rev	Date	Description	Drn	Chk	App
00	04/10/2023	2485116	EC	RH	BL

Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 4:

Ground Level Tree Assessment Results
Page 3 of 7

0 100 200 300
Metres
SCALE: 1:8,000 @ A3

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Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 4 - GLTA.aprx

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442400 442200 442000 441800 441600 441400 441200 441000 440800 440600 440400

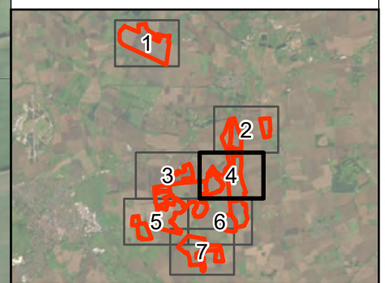
T9

Legend:

Site boundary

Overall Tree Suitability

- High
- Moderate
- Low



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Peartree Solar Farm

RSK biocensus
EXPERTS IN ECOLOGY

TITLE: Figure 4:

Ground Level Tree Assessment Results
Page 4 of 7

0 100 200 300
Metres
SCALE: 1:8,000 @ A3

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Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 4 - GLTA.aprx

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440600 440400 440200 440000 439800 439600 439400 439200 439000 438800 438600

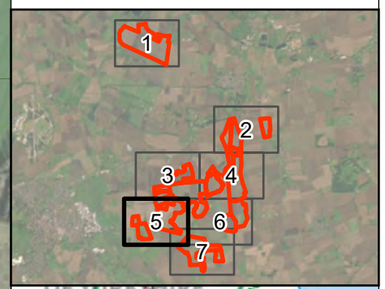
T15 T16 T17 T19 T20 T21 T22 T23 T24 T25 T26 T27 T28 T29 T30 T31 T32 T33

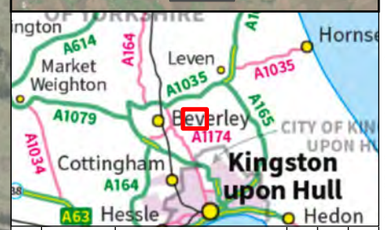
Legend:

Site boundary

Overall Tree Suitability

- High
- Moderate
- Low





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Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 4:

Ground Level Tree Assessment Results
Page 5 of 7

0 100 200 300

Metres

SCALE: 1:8,000 @ A3

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Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 4 - GLTA.aprx

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440600 440400 440200 440000 439800 439600 439400 439200 439000 438800 438600

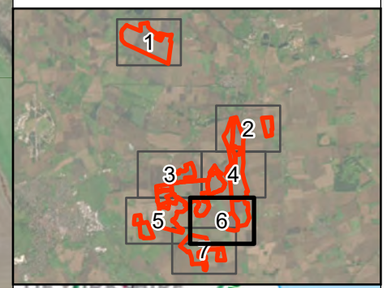
T34 T35 T36 T37 T39 T38 T40 T41 T47 T44 T45

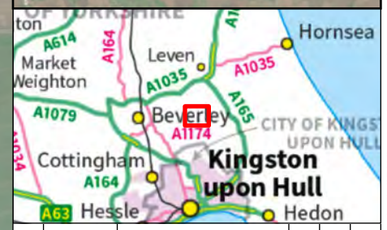
Legend:

Site boundary

Overall Tree Suitability

- High
- Moderate
- Low





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Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 4:

Ground Level Tree Assessment Results
Page 6 of 7

0 100 200 300
Metres
SCALE: 1:8,000 @ A3

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Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 4 - GLTA.aprx

508200 508400 508600 508800 509000 509200 509400 509600 509800 510000 510200 510400 510600 510800

439600 439400 439200 439000 438800 438600 438400 438200 438000 437800 437600

T28 T29 T30 T31 T32 T33 T42 T43 T44 T45 T46 T47 T48 T49 T50 T51 T52 T53 T54

Legend:

Site boundary

Overall Tree Suitability

- High
- Moderate
- Low

1 2 3 4 5 6 7

Hornsea Market Weighton Leven Beverley Cottingham Kingston upon Hull Hessle Hedon A614 A164 A1035 A165 A1079 A63

Rev	Date	Description	Drn	Chk	App
00	04/10/2023	2485116	EC	RH	BL

Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 4:

Ground Level Tree Assessment Results
Page 7 of 7

0 100 200 300
Metres
SCALE: 1:8,000 @ A3

N W E S

REV 00

Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 4 - GLTA.aprx

501000 502000 503000 504000 505000 506000 507000 508000 509000 510000 511000 512000 513000 514000 515000 516000 517000

449000 448000 447000 446000 445000 444000 443000 442000 441000 440000 439000 438000 437000 436000

Easingwold Plantation
Easingwold Farm
Tophill Low
Watton Carr
Tophill Low
Leven Canal
Monk Dyke Wood
Routh
Meaux Lane
Monk Dyke
Little Decoy, Meaux
Cote Wood
Figham Pastures
Weel Carr Drain
Meaux
Arnold Drain

Legend:

- Site boundary
- 1km buffer
- Non-statutory sites (nearest points to the site boundary)
- Sites of Special Scientific Interest (SSSI) within 1km of the site boundary

Rev	Date	Description	Drn	Chk	App
00	11/10/2023	2485116	EC	RS	BL

Peartree Solar Farm

RSK biocensus EXPERTS IN ECOLOGY

TITLE: Figure 5:

Sites of Special Scientific Interest and Non-Statutory Sites Nearest Points

0 600 1,200 1,800
Metres
SCALE: 1:50,000 @ A3

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Document Path: C:\Users\Elise.Cliche\RSK Group\RSK Biocensus - 06 GIS - 2485116 - Peartree Hill Solar Farm\03 - APRX\2485116 - Peartree Solar Farm - Figure 5 - SSSIs and Non-Stat centroids.aprx

APPENDIX A – TARGET NOTES

The locations of the following target notes (TN) are shown in Figure 2.

TN1	A mosaic of species-poor grassland dominated by False Oat-grass (*Arrhenatherum elatius*) with rank, weedy vegetation and patchy scrub with Hawthorn (*Crataegus monogyna*) and Grey Willow (*Salix cinerea*). The weedy vegetation is dominated by Common Nettle (*Urtica dioica*), Cleavers (*Galium aparine*) and Hemlock (*Conium maculatum*) with other species including Hogweed (*Heracleum sphondylium*), Creeping Thistle (*Cirsium arvense*) and Common Reed (*Phragmites australis*). It is also surrounded by a 4-5 m wide strip of species-poor grassland with Common Couch (*Elymus repens*), Perennial Rye-grass (*Lolium perenne*), Common Nettle, Creeping Thistle, Hogweed, and infrequent Soft-brome (*Bromus hordeaceus*) and Perennial Sow-thistle (*Sonchus arvensis*).
TN2	A ditch with a *c*.2 m wide channel. The water appeared to be strongly eutrophic with algae and scum on the surface. However, where not dominated by Common Reed (*Phragmites australis*) there was a range of aquatic species including abundant Branched Bur-reed (*Sparganium erectum*), frequent Common Reed, Soft-rush (*Juncus effusus*), and Hedge Bindweed (*Calystegia sepium*) and rarely encountered Water-plantain (*Alisma plantago-aquatica*) and Broad-leaved Pondweed (*Potamogeton natans*).
TN3	Semi-mature Sycamore (*Acer pseudoplatanus*) woodland with occasional Pedunculate Oak (*Quercus robur*) just off Hornsea Road (A1035). There was a patchy Bramble (*Rubus fruticosus* agg.) and Elder (*Sambucus nigra*) shrub layer with little to no ground-flora present.
TN4	Long line of semi-mature to mature trees going north then east through crop fields. The north-south line was almost exclusively Ash (*Fraxinus excelsior*), with the east-west line being dominated by Pedunculate Oak (*Quercus robur*) with occasional Horse-chestnut (*Aesculus hippocastanum*), Ash and Elder (*Sambucus nigra*). No Ground-level tree assessment for roosting bats was carried out at the time due to over 100 trees being present.
TN5	A barn owl box on large Ash (*Fraxinus excelsior*) tree on field boundary. A very large deposit of older pellets was found beneath the box, indicating previous use as a likely nest site.
TN6	The location of a likely outlier badger sett along a major drain which leads into Drewery's Sock Dike. The sett was on the steep bank down to the major ditch on which there was a tall Hawthorn (*Crataegus monogyna*) hedgerow. The large drainage ditch contained a large amount of Reed Sweet-grass (*Glyceria maxima*), Meadowsweet (*Filipendula ulmaria*) and Common Reed (*Phragmites australis*).
TN7	A small area of young woodland at the intersection of four fields and some ditches. The most common tree species are Wild Cherry (*Prunus avium*), Beech (*Fagus sylvatica*) and Pedunculate Oak (*Quercus robur*) with a sparse understorey of Elder (*Sambucus nigra*). The ground-flora was dominated by Common Nettle (*Urtica dioica*).
TN8	A moderately species-poor area of modified grassland (up to eight or nine species/m^2) but with a range of species scattered throughout. The short grassland was dominated by a mix of Perennial Rye-grass (*Lolium perenne*) and Yorkshire-fog (*Holcus lanatus*) with Meadow Buttercup (*Ranunculus acris*) and White Clover (*Trifolium repens*). However, also occasionally or rarely present were Red Fescue (*Festuca rubra*), Lesser Trefoil (*Trifolium dubium*), Common Sorrel (*Rumex acetosa*), Spear Thistle (*Cirsium vulgare*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Meadow Vetchling (*Lathyrus pratensis*) and Lady's Bedstraw (*Galium verum*).
TN9	A barn owl box on an Ash (*Fraxinus excelsior*) tree over a minor, wet ditch. The box is at other side of the tree from the site, facing away.
TN10	A strip of sown grassland with abundant False Oat-grass (*Arrhenatherum elatius*), Crested Dog's-tail (*Cynosurus cristatus*), Creeping Thistle (*Cirsium arvense*) and Creeping Bent (*Agrostis stolonifera*). Frequent species included Yorkshire-fog (*Holcus lanatus*), Common Knapweed (*Centaurea nigra*) and Lady's Bedstraw (*Galium verum*). Occasional to rare species included Yarrow (*Achillea millefolium*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Common Ragwort (*Jacobaea vulgaris*), Oxeye Daisy (*Leucanthemum vulgare*), Red Fescue (*Festuca rubra*), Hedge Bedstraw (*Galium mollugo*), Dandelion (*Taraxacum* agg.), Creeping Buttercup (*Ranunculus repens*) and Lesser Trefoil (*Trifolium dubium*).
TN11	Approximately 10-year-old, planted mixed woodland with Pedunculate Oak (*Quercus robur*), Wild Cherry (*Prunus avium*), Ash (*Fraxinus excelsior*) and a line of European Larch (*Larix decidua*) and Rowan (*Sorbus aucuparia*) to the west. The patchy ground flora mostly included Common Nettle (*Urtica dioica*), Ground-ivy (*Glechoma hederacea*) False Brome (*Brachypodium sylvaticum*) and

	Cock's-foot (*Dactylis glomerata*) with Ash and Hawthorn (*Crataegus monogyna*) saplings. Other species included Cow Parsley (*Anthriscus sylvestris*), Hogweed (*Heracleum sphondylium*), Rough Chervil (*Chaerophyllum temulum*) and Herb-Robert (*Geranium robertianum*).
TN12	Fallow field with stubble. Groundsel (*Senecio vulgaris*) was abundant, Hoary Willowherb (*Epilobium parviflorum*) frequent and other common weeds occasional such as Field Horsetail (*Equisetum arvense*), American Willowherb (*Epilobium ciliatum*), Smooth Sow-thistle (*Sonchus oleraceus*), Great Willowherb (*Epilobium hirsutum*) and Hedge Mustard (*Sisymbrium officinale*).
TN13	Plantation of fir saplings (*Abies* sp.) with abundant weeds including Common Poppy (*Papaver rhoeas*), Perennial Sow-thistle (*Sonchus arvensis*) and Creeping Thistle (*Cirsium arvense*).
TN14	Routh and Meaux Drain where it passes into the site boundary. The ditch is wide (over 5 m from the top of each bank) but only had a thin (*c*.1 m) channel of shallow water at the time of the survey, with dense, grassy marginal vegetation throughout, dominated by Reed Canary-grass (*Phalaris arundinacea*) and Common Reed (*Phragmites australis*). Wild Angelica (*Angelica sylvestris*) and Meadowsweet (*Filipendula ulmaria*) were also frequent. The tops of the banks supported MG1 *Arrhenatherum elatius* grassland with frequent Common Knapweed (*Centaurea nigra*).
TN15	One of the few ditches in this area with a relatively more species-rich mix of more open grassland on the banks compared to other ditches across the site. However, scattered scrub with Bramble (*Rubus fruticosus* agg.), Hawthorn (*Crataegus monogyna*), Wych Elm (*Ulmus glabra*) and Common Nettle (*Urtica dioica*) were still occasional. The grassland is referable to MG1 *Arrhenatherum elatius* grassland with frequent to abundant Common Knapweed (*Centaurea nigra*). Other species included Crosswort (*Cruciata laevipes*), Field Bindweed (*Convolvulus arvensis*), Common Couch (*Elymus repens*), Tufted Vetch (*Vicia cracca*), Common Reed (*Phragmites australis*), Meadow Vetchling (*Lathyrus pratensis*), Lesser Trefoil (*Trifolium dubium*), Ribwort Plantain (*Plantago lanceolata*), Cat's-ear (*Hypochaeris radicata*) and most notably, Fairy Flax (*Linum catharticum*).
TN16	A diffuse boundary between the 3-4 m wide track of modified grassland and woodland edge with overhanging branches of Deodar (*Cedrus deodara*), Ash (*Fraxinus excelsior*) and Pedunculate Oak (*Quercus robur*) with a ground flora of Common Reed (*Phragmites australis*) and Common Nettle (*Urtica dioica*). Multiple trees have features suitable for roosting bats. The grassland on the track was dominated by Perennial Rye-grass (*Lolium perenne*), with Greater Plantain (*Plantago major*), Dandelion (*Taraxacum* agg.) and White Clover (*Trifolium repens*).
TN17	A small area of reedbed (dry at the time of the survey) with Common Reed (*Phragmites australis*) and scattered Grey Willow (*Salix cinerea*). The area is surrounded by tall, dense scrub dominated by Bramble (*Rubus fruticosus* agg.) with Common Nettle (*Urtica dioica*) and Large Bindweed (*Calystegia silvatica*).
TN18	A small area of young to mature Pedunculate Oak (*Quercus robur*) and Ash (*Fraxinus excelsior*) woodland with an understorey of Hawthorn (*Crataegus monogyna*), Elder (*Sambucus nigra*), a species of elm (*Ulmus* species) and saplings of Ash, Alder (*Alnus glutinosa*) and Horse-chestnut (*Aesculus hippocastanum*). The ground flora is species poor with Bramble (*Rubus fruticosus* agg.), Cleavers (*Galium aparine*), Common Nettle (*Urtica dioica*), Ivy (*Hedera helix*), Red Campion (*Silene dioica*), Hogweed (*Heracleum sphondylium*), Ground-ivy (*Glechoma hederacea*) and Lords-and-Ladies (*Arum maculatum*). Several trees have potential for roosting bats.
TN19	A relatively large block of woodland with similarly aged, semi-mature Sycamore (*Acer pseudoplatanus*) and Scots Pine (*Pinus sylvestris*) with no understorey aside from a scattering of Sycamore saplings and line of Hawthorn (*Crataegus monogyna*) along northern boundary. The species-poor ground flora included Yorkshire-fog (*Holcus lanatus*), Common Nettle (*Urtica dioica*) and Red Campion (*Silene dioica*).
TN20	A small block of mostly young woodland with some mature Pedunculate Oak (*Quercus robur*) and semi-mature Ash (*Fraxinus excelsior*). The younger trees included European Larch (*Larix decidua*), Common Whitebeam (*Sorbus aria*), Field Maple (*Acer campestre*), Rowan (*Sorbus aucuparia*) and Norway Maple (*Acer platanoides*). There was an understorey/edge of Hawthorn (*Crataegus monogyna*), under which was Common Nettle (*Urtica dioica*), Ash saplings, Wood Avens (*Geum urbanum*) and False Brome (*Brachypodium sylvaticum*).
TN21	A moderately species-rich wildflower margin with a range of species including Alsike Clover (*Trifolium hybridum*), White Clover (*Trifolium repens*), Red Clover (*Trifolium pratense*), Crimson Clover (*Trifolium incarnatum* ssp. *incarnatum*), Creeping Thistle (*Cirsium arvense*), Phacelia (*Phacelia tanacetifolia*), Perennial Sow-thistle (*Sonchus arvensis*), Prickly Sow-thistle (*Sonchus asper*), Cornflower (*Centaurea cyanus*), Common Bird's-foot-trefoil (*Lotus corniculatus*), Wild Carrot (*Daucus carota* ssp. *carota*), Fool's Parsley (*Aethusa cynapium*) and Common Poppy (*Papaver rhoeas*).
TN22	A wide fallow strip with abundant Creeping Thistle (*Cirsium arvense*) and a few other common weeds.

TN23	One of only two species-rich hedges well within the site boundary, likely species-rich due to the fairly recent planting of gaps with a variety of species, many of which appeared less than 10 years old. The hedge was *c*.2.1 m tall and wide with Hawthorn (*Crataegus monogyna*) being most frequent but other species including Blackthorn (*Prunus spinosa*), Sweet-briar (*Rosa rubiginosa*), Guelder-rose (*Viburnum opulus*), Ash (*Fraxinus excelsior*), Pedunculate Oak (*Quercus robur*), Field Maple (*Acer campestre*) and Southern Dogwood (*Cornus sanguinea* ssp. *australis*). There is also a mature Pedunculate Oak close to the centre of the hedge. The ground flora was dominated by Cleavers (*Galium aparine*) but also included Common Nettle (*Urtica dioica*), Ivy (*Hedera helix*) and occasional Common Reed (*Phragmites australis*), despite there being no obvious ditch. There is no margin to the north as the hedge is along a track, but there was a 1 m strip of disturbed MG1 *Arrhenatherum elatius* grassland to the south.
TN24	The boundary of the site where it is adjacent to Cote Wood Local Wildlife Site. The mature Ash (*Fraxinus excelsior*) and Pedunculate Oak (*Quercus robur*) woodland also included Sycamore (*Acer pseudoplatanus*), Scots Pine (*Pinus sylvestris*) and European Larch (*Larix decidua*) with an understorey of Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Holly (*Ilex aquifolium*), old coppiced Hazel (*Corylus avellana*), Field Maple (*Acer campestre*) and Honeysuckle (*Lonicera periclymenum*). The understorey appeared to include Common Nettle (*Urtica dioica*), Ivy (*Hedera helix*), Bramble (*Rubus fruticosus* agg.), Red Camption (*Silene dioica*), Wood Avens (*Geum urbanum*) and False Brome (*Brachypodium sylvaticum*). The woodland is somewhat separated from the site by a mostly dry ditch with Bramble.
TN25	A very shallow pond with a species of Water-starwort (*Callitriche* species) within young to semi-mature woodland by the side of the road. Ash (*Fraxinus excelsior*) and Hybrid Black-poplar (*Populus × canadensis*) are the most common tree species with Sycamore (*Acer pseudoplatanus*) and Pedunculate Oak (*Quercus robur*) also present. Scrub in the centre and as an understorey includes Hawthorn (*Crataegus monogyna*), Norway Spruce (*Picea abies*), Beech (*Fagus sylvatica*), Dogwood (*Cornus sanguinea*), Blackthorn (*Prunus spinosa*) and Bramble (*Rubus fruticosus* agg.). The ground flora was dominated by Ivy (*Hedera helix*) in most places but also included Cleavers (*Galium aparine*), Common Nettle (*Urtica dioica*) and Hogweed (*Heracleum sphondylium*).
TN26	Meaux West Drain where it crosses the site. Vegetation in the wide, damp ditch is dominated by Common Reed (*Phragmites australis*) with Wild Angelica (*Angelica sylvestris*) and infrequent Hemp Agrimony (*Eupatorium cannabinum*). The banks are covered in variable grassland dominated by False Oat-grass (*Arrhenatherum elatius*) with some Meadow Vetchling (*Lathyrus pratensis*) and Common Knapweed (*Centaurea nigra*), in addition to patchy scrub, mostly Elder (*Sambucus nigra*), from a defunct hedge.
TN27	A long, winding, slightly gappy, variable species-rich hedge on the boundary close to the south of the site. Blackthorn (*Prunus spinosa*) is perhaps the most abundant species, with others including Hawthorn (*Crataegus monogyna*), Field Maple (*Acer campestre*), Grey Willow (*Salix cinerea*), Spindle (*Euonymus europaeus*), Elder (*Sambucus nigra*), Hazel (*Corylus avellana*), a species of rose (*Rosa* species) and Spurge-laurel (*Daphne laureola*). There are also several trees along the hedge including mature Pedunculate Oaks (*Quercus robur*) and young to semi-mature Ash (*Fraxinus excelsior*). There is also a 1-m-deep, mostly dry ditch with scrub and common herbs.
TN28	One of two internal, species-rich hedges on the site. The hedge was c.2.4 m tall and 1.9 m wide and only just species-rich, being mostly dominated by Hawthorn (*Crataegus monogyna*). However, there is a single, mature Pedunculate Oak (*Quercus robur*) and some younger oak trees throughout the hedge, and other woody species included Elder (*Sambucus nigra*), a species of rose (*Rosa* species), Blackthorn (*Prunus spinosa*) and Goat Willow (*Salix caprea*). A dry, internal ditch supported a species-poor ground flora of Bramble (*Rubus fruticosus* agg.), Common Nettle (*Urtica dioica*), Cleavers (*Galium aparine*) and Great Willowherb (*Epilobium hirsutum*).
TN29	A pond at the south-eastern edge of a large area of planted scrub. The pond had abundant marginal vegetation with Reed Canary-grass (*Phalaris arundinacea*), Bulrush (*Typha latifolia*) and Reed Sweet-grass (*Glyceria maxima*). The scrub, planted in the recent past for game cover includes a wide range of mostly native, but also non-native woody species and paths of mown, modified grassland cutting through it. Species include Bramble (*Rubus fruticosus* agg.), Hawthorn (*Crataegus monogyna*), Blackthorn (*Prunus spinosa*), Wild Privet (*Ligustrum vulgare*), Alder (*Alnus glutinosa*), Hazel (*Corylus avellana*), Rowan (*Sorbus aucuparia*), Buckthorn (*Rhamnus catharticus*), Guelder-rose (*Viburnum opulus*), Snowberry (*Symphoricarpos albus*), Coralberry (*Symphoricarpos orbiculatus*), and Southern Dogwood (*Cornus sanguinea* ssp. *australis*).
TN30	A strip of planted scrub with a path cut through, very similar to the scrub described in Target Note 29.
TN31	A small field with tall, rank, species-poor grassland. The grassland appeared to be maintained for the pheasants which were being reared within an enclosure in the field. Cock's-foot (*Dactylis glomerata*) is dominant with frequent species including Spear Thistle (*Cirsium vulgare*), Broad-leaved Dock

	(*Rumex obtusifolius*) and Common Ragwort (*Jacobaea vulgaris*). Reed Canary-grass (*Phalaris arundinacea*) and Chicory (*Cichorium intybus*), present in the margins of the field, were also occasional in the grassland.
TN32	A field planted with the young saplings of a fir species (*Abies* sp.) and an abundance of several common arable weeds including Common Poppy (*Papaver rhoeas*), Great Willowherb (*Epilobium hirsutum*), Perennial Rye-grass (*Lolium perenne*), Creeping Thistle (*Cirsium arvense*), Black-grass (*Alopecurus myosuroides*), Equal-leaved Knotgrass (*Polygonum arenastrum*), and Perennial Sow-thistle (*Sonchus arvensis*).
TN33	An area to the southern tip of the site which was not within the red-line boundary at the time of the survey. It appears to be a small, triangular field of improved grassland surrounded on all sides by hedgerows.

APPENDIX B – NATURE CONSERVATION LEGISLATION AND POLICY

International Legislation

The following international conventions and directives apply to biodiversity protection in the UK. Post-'Brexit', even though European Union (EU) directives no longer directly apply to the UK, the provisions therein are enshrined in both domestic legislation and international agreements. Legislation has been enacted to ensure the regulations derived from these remain in force[3].

The Convention on Biological Diversity 1992 *et seq.*

This multilateral treaty (https://www.cbd.int/doc/legal/cbd-en.pdf), signed by 150 government leaders at the 1992 Rio Earth Summit, has three main goals, of which one is the conservation of biological diversity. Article 6 requires countries to develop national biodiversity strategies, plans or programmes. In response, the UK developed the UK Biodiversity Action Plan (BAP) 1994 (https://jncc.gov.uk/our-work/uk-bap/) as well as county-specific BAPs. Subsequent to this, parties of the convention agreed the supplementary Nagoya Protocol 2010 (available at https://www.cbd.int/abs/doc/protocol/nagoya-protocol-en.pdf), adopting the Strategic Plan for Biodiversity 2011-2020. The purpose of this Strategic Plan was to provide a framework for establishing national and regional biodiversity targets (https://www.cbd.int/doc/strategic-plan/2011-2020/Aichi-Targets-EN.pdf).

Directive 2009/147/EC of the European Parliament and of the Council on the conservation of wild birds (Birds Directive) 2009
https://www.legislation.gov.uk/eudr/2009/147

The Birds Directive 2009 relates to the conservation of all species of naturally occurring birds in their wild state in the territory of the EU Member States (MSs) to which the treaty applies. Under the Birds Directive, the most suitable areas of conservation of the Annex I species are to be designated as Special Protection Areas (SPAs), as part of the European Natura 2000 network. Post Brexit, SPAs are no longer considered part of Natura 2000 and are instead components of the UK's 'national site network', but their highly protected status is unchanged. Maintaining a coherent network of protected sites with overarching conservation objectives is still required in order to fulfil the commitment made by government to maintain environmental protections and continue to meet the UK's international legal obligations.

Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora (Habitats Directive) 1992
https://www.legislation.gov.uk/eudr/1992/43

The Habitats Directive 1992 requires EU MSs to maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of community interest, which are listed

[3] Further information relating to England and Wales can be found here: https://www.gov.uk/government/publications/changes-to-the-habitats-regulations-2017/changes-to-the-habitats-regulations-2017. A similar exercise has been undertaken in Scotland and Northern Ireland.

under Annex I, II, IV and/or V. Species listed under Annex IV are known as 'European Protected Species' (EPS), and have retained their protected status in UK domestic legislation post-Brexit.

Under the Habitats Directive, EU Member States are required to contribute to the Natura 2000 network through the designation of Special Areas of Conservation (SACs) for natural habitat types listed in Annex I and habitats of species listed in Annex II. Post Brexit, SACs are no longer considered part of the European Natura 2000 network and are instead components of the UK's 'national site network', but their highly protected status is unchanged.

The Convention on Wetlands of International Importance Especially as Waterfowl Habitat 1971: the Ramsar Convention

Accessible via https://jncc.gov.uk/our-work/ramsar-convention/

The Ramsar Convention is an intergovernmental treaty focused on the conservation and sustainable use of wetland, primarily as habitats for water birds. Under the convention, each ratified country is required to identify and designate sites (Ramsar sites) that meet the criteria for identifying a wetland of international importance, i.e. containing representative, rare or unique wetland types. In addition, the convention promotes international co-operation to promote the wise use of all wetlands and their resources.

Habitats Regulations Assessment (HRA): a note

There is a requirement under the EU nature directives, and enshrined in country-specific domestic legislation[4] (see below), to undertake a screening exercise to determine whether any sites that form part of the 'national site network' (formerly Natura 2000) are likely to be significantly affected by any proposal (project or plan). The assessment must consider the proposals alone and also in combination with other plans and projects, if they result from activities that are not directly connected with, or necessary to, the management of the designated sites. If significant effects are likely, an Appropriate Assessment (AA) will need to be carried out. The screening, any AA, and any subsequent assessment, are collectively known as a Habitats Regulations Assessment (HRA). The HRA needs to take into account each of the 'Qualifying Features' (habitats or species) that justified the site being designated. Ramsar sites are treated in the same way as SACs and SPAs in HRAs, as are sites which have not been fully adopted i.e. candidate SACs (cSACs) and potential SPAs (pSPAs).

The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention) 1979

Accessible via**:** https://jncc.gov.uk/our-work/the-convention-on-the-conservation-of-migratory-species-of-wild-animals/#convention-summary

The Bonn Convention was adopted in 1979 and came into force in 1985. Contracting Parties work together to conserve migratory species and their habitats by providing strict protection for endangered migratory species (listed in Appendix I of the Convention), concluding multilateral agreements for the conservation and management of migratory species which require or would benefit from international cooperation (listed in Appendix II), and by undertaking cooperative

[4] In England and Wales: the Conservation of Habitats and Species Regulations 2017 (as amended).
In Scotland: the Conservation (Natural Habitats &c.) Regulations 1994 (as amended).
In Northern Ireland: the Conservation (Natural Habitats, &c) Regulations (Northern Ireland) 1995 (as amended). .
In the UK offshore area: the Conservation of Offshore Marine Habitats and Species Regulations 2017 (as amended).

research activities. The UK Government ratified the Bonn Convention in 1985. The current legally-binding Agreements under the Convention include EUROBATS[5].

The Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) 1979
https://www.coe.int/en/web/bern-convention

The principal aims of the Bern Convention 1979 are to ensure the conservation and protection of wild plant and animal species and their natural habitats (listed in Appendices I and II of the Convention), to increase cooperation between contracting parties, and to regulate the exploitation of those species (including migratory species) listed in Appendix III. To this end, the Bern Convention imposes legal obligations on contracting parties, protecting over 500 wild plant species and more than 1,000 wild animal species. The UK Government ratified the Bern Convention in 1982.

National Legislation

The following pieces of domestic legislation apply to biodiversity protection in the UK.

The Wildlife and Countryside Act (WCA) 1981
https://www.legislation.gov.uk/ukpga/1981/69

The Wildlife and Countryside Act 1981 (as amended) is the primary piece of legislation relating to nature conservation in the UK, though it has been adapted in different ways in the devolved administrations. It was initially enacted to implement the Bern Convention, Bonn Convention and the Birds Directive (described above).

The act is supplemented by provisions in the Countryside and Rights of Way (CRoW) Act 2000 and the Natural Environment and Rural Communities (NERC) Act 2006. In addition to the Habitat Regulations (described below), the WCA provides protection for species listed in Schedules 1 (birds), 5 (other animals) and 8 (plants) of the Act. It provides for the notification and confirmation of Sites of Special Scientific Interest (SSSIs) in England and Wales[6]. It also sets out, in other schedules, important and invasive species which are legally protected or require management.

All species of bird are protected under the WCA. The legislation makes it an offence to intentionally:

- kill, injure or take any wild bird;
- take, damage, or destroy the nest of any wild bird while that nest is in use or being built; or
- take or destroy an egg of any wild bird.

Those species of birds listed on Schedule 1 of the WCA are afforded additional protection, which deems it an offence to intentionally or recklessly:

[5] More information available at https://jncc.gov.uk/our-work/agreement-on-the-conservation-of-populations-of-european-bats-eurobats

[6] Duty replaced by the Nature Conservation (Scotland) Act 2004 (as amended) and the Nature Conservation and Amenity Lands (Northern Ireland) Order 1985 (as amended) in those countries.

- disturb any wild bird included in Schedule 1 while it is building a nest or is in, on or near a nest containing eggs or young; or
- disturb dependent young of such a bird.

Under Section 9 of the WCA, for animals listed on Schedule 5, it is an offence in England and Wales to intentionally or recklessly:

- kill, injure or take any wild animal listed on Schedule 5*;
- possess or control any live or dead those wild animals or anything derived from it*;
- damage or destroy any structure or place which wild animals listed on Schedule 5 uses for shelter or protection*;
- disturb any such animal while it is occupying a structure or place of shelter or protection;
- obstruct access to any structure or place used by any such animal for shelter or protection; and
- sell, offer or expose for sale, or have in their possession or transports for the purpose of sale, any live or dead wild animal listed on Schedule 5 or any part of, or anything derived from such an animal.

As noted above, there are minor differences between the offences in England and Wales outlined above, and those in Scotland / Northern Ireland. The three clauses marked with asterisks do not apply to EPS in England and Wales, as these offences are included in the 'Habitats Regulations' (see below). In addition, the Wildlife and Countryside Act 1981 is no longer relevant to EPS in Scotland or Northern Ireland, which instead are afforded full protection by the 'Habitats Regulations' (see below).

In addition to EPS, species commonly found on development sites include water voles (*Arvicola amphibius*) and widespread species of reptiles: common lizard (*Zootoca vivipara*); slow-worm (*Anguis fragilis*); grass snake (*Natrix helvetica*); and adder (*Vipera berus*). These four reptile species receive partial protection, which prevents the intentional or deliberate killing and injuring of reptiles or offering them for sale.

Section 14(2)[7] states that it is an offence to plant or otherwise cause to grow any plant in the wild at a place outside its native range.

Section 16(i) of the Act makes provision for derogation licences to be issued *"for the purposes of preserving public health or public … safety"*. For confirmation of this, it would be appropriate to consult the relevant statutory nature conservation body (SNCB)[8].

Until recently, there has been no provision within the Act for derogation licences to be issued for the purposes of development, although Section 10 provides a defence in cases that may be considered to be: *"the incidental result of a lawful operation and could not reasonably have been avoided"* if certain conditions are met.

As a result of the Environment Act 2021, the introduction of the 'overriding public interest' ('OPI') test was added to the licensing purposes in the WCA, from October 2022, though this only applies in England.

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7 In Scotland, as amended by Section 14 of the Wildlife and Natural Environment (Scotland) Act 2011.

8 SNCBs are - in England: Natural England; in Wales: Natural Resources Wales; in Scotland: NatureScot; in Nortern Ireland: Department of Agriculture, Environment and Rural Affairs (DAERA).

The Conservation of Habitats and Species Regulations (Habitat Regulations) 2017 https://www.legislation.gov.uk/uksi/2017/1012 England and Wales

The Conservation (Natural Habitats, &c.) Regulations 1994 https://www.legislation.gov.uk/uksi/1994/2716/contents/made Scotland[9] (as amended, notably by The Conservation (Natural Habitats, &c.) Amendment (Scotland) Regulations 2007).

The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended, notably by The Conservation (Natural Habitats, etc.) (Amendment) Regulations (Northern Ireland) 2007**)** https://www.legislation.gov.uk/nisr/1995/380/contents/made Northern Ireland[10]

The Habitats Regulations 2017 consolidated the various amendments made to the 1994 Habitat Regulations, which were developed to implement the Birds Directive and Habitats Directive (see above) at a national level, though this consolidation only applies in England and Wales. As noted above, in Scotland and in Northern Ireland, the original versions of the Regulations in each region have been retained and amended to include protections for EPS that were initially provided under the WCA (or its equivalent).

The Regulations (as amended) provide for the designation and protection of the national site network (formerly 'Natura 2000 sites'), the adaptation of planning and other controls for those sites, and the protection of EPS (listed on Schedules 2 and 5).

The 2017 Regulations (England and Wales, Reg. 43) deems it an offence to:

- deliberately capture, injure or kill a wild animal of a EPS,
- deliberately disturb wild animals of any such species,
- deliberately take or destroy the eggs of such an animal, or
- damage or destroy a breeding site or resting place of such an animal.

For the purposes of paragraph (b), disturbance of animals includes in particular any disturbance which is likely to:

- impair their ability to survive, to breed or reproduce, or to rear or nurture their young, or in the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- to affect significantly the local distribution or abundance of the species to which they belong.

There are also restrictions on transport, possession and sale.

The Habitats Regulations 1994 which apply in Scotland with a number of amendments, provide full protection to EPS without recourse to the WCA[11].

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9 This is the original text, and that amendments relevant to Scotland can be found here: https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/legal-framework/habitats-directive-and-habitats-regulations/habitats-regulations

10 This is the original text, and that amendments relevant to Northern Ireland can be found here: https://www.netregs.org.uk/legislation/northern-ireland-environmental-legislation/current-legislation/conservation/

11 https://www.nature.scot/professional-advice/protected-areas-and-species/protected-species/legal-framework/habitats-directive-and-habitats-regulations/european-protected

The legislation in Northern Ireland is similar to Scotland in that the protection for EPS has been transferred to the Conservation (Natural Habitats, & c.) Regulations (NI) 1995 (as amended).

It is possible to obtain a derogation licence from the relevant SNCB[8] to permit activities which would otherwise contravene the regulations above, including for development purposes, when certain conditions are met. Failure to satisfy the Regulations and obtain a licence where required could result in prosecution and lead to fines and possible imprisonment.

To meet the requirements in Regulation 63(1) [48(1) of the 1994 Regulations in Scotland], an HRA is required (see note in previous section).

Currently (2021), all EPS are also listed on Schedule 5 of the WCA (outlined above), as it applies in England and Wales, though only some clauses of the WCA apply (Section 9 4(b), (c) and 5). EPS often encountered on development sites include GCN (*Triturus cristatus*), all species of bats, dormice (*Muscardinus avellanarius*) and otters (*Lutra lutra*).

Conservation of Offshore Marine Habitats and Species Regulations 2017
https://www.legislation.gov.uk/uksi/2017/1013

The Conservation of Offshore Marine Habitats and Species Regulations 2017 transposed into national law the Habitats Directive (and the Bird Directive in the UK offshore areas). These regulations apply to the UK's offshore marine area which covers waters beyond 12 nautical miles, within British Fishery Limits and the seabed within the UK Continental Shelf Designated Area.

These regulations enable the designation and protection of areas that host habitats and species of European importance in the offshore marine area. These sites were previously defined collectively as 'European offshore marine sites' and now, together with all other terrestrial and marine SACs and SPAs across the UK, form a network of sites known as the 'national site network'.

Countryside and Rights of Way Act 2000
https://www.legislation.gov.uk/ukpga/2000/37

The Countryside and Rights of Way (CRoW) Act 2000 provides for public access on foot to certain land types, amends the law for public rights of way, increases protection for SSSIs, and strengthens wildlife enforcement legislation. It applies only in England and Wales.

The Natural Environment and Rural Communities (NERC) Act 2006; The Environment (Wales) Act 2016
https://www.legislation.gov.uk/ukpga/2006/16

The Natural Environment and Rural Communities (NERC) Act 2006, Section 40 requires that any public body or statutory undertaker in England must have regard to the purpose of conservation of biological diversity in a manner that is consistent with the exercise of their normal functions. This may include enhancing, restoring or protecting a population or a habitat. The intention is to help ensure that biodiversity becomes an integral consideration in the development of policies, and that decisions of public bodies work with the grain of nature and not against it. In Wales, a similar duty has been moved to Section 6 of the Environment (Wales) Act 2016.

As part of this duty, statutory undertakers must have regard to the list of habitats and species which are of principal importance for the purpose of maintaining and enhancing biodiversity. For

England, the duty to compile such a list is captured under Section 41 of the NERC Act; in Wales, under Section 7 of the Environment (Wales) Act. The lists for England are accessible online via the National Archive[12]; for Wales via https://www.biodiversitywales.org.uk/.

The Hedgerows Regulations 1997
https://www.legislation.gov.uk/uksi/1997/1160/made

The Hedgerows Regulations 1997 provide protection for 'important' hedgerows for which replanting is not a substitute. The 'importance' of a hedgerow depends upon several archaeological, wildlife and landscape criteria (which are outlined in the Regulations). The regulations deem it an offence to remove an 'important hedgerow' without prior notification to the relevant local planning authority.

Protection of Badgers Act 1992
https://www.legislation.gov.uk/ukpga/1992/51

Badgers and their setts are protected under the Protection of Badgers Act 1992 (England, Wales and Scotland). The key part of this legislation in relation to the proposed development are in Section 3, which deems it an offence to:

- damage a badger sett or any part of it;
- destroy a badger sett;
- obstruct access to, or any entrance of, a badger sett;
- disturb a badger when it is occupying a badger sett,
- intend to do any of those things or be reckless as to whether those actions would have any of the consequences listed above.

Derogation licences may be obtained from the relevant SNCB[8] under Section 10 of the Act for the purpose of development, to permit activities which would otherwise be unlawful.

Note: there are additional provisions relating to badgers under the WCA Section 11 (Prohibition of certain methods of killing or taking wild animals).

The Wild Mammals (Protection) Act 1996
https://www.legislation.gov.uk/ukpga/1996/3

All wild mammals are protected by The Wild Mammals (Protection) Act 1996 (as amended). This makes it an offence to mutilate, kick, beat, nail, or otherwise impale, stab, burn, stone, crush, drown, drag or asphyxiate any wild mammal.

Invasive Alien Species (Enforcement and Permitting) Order 2019
(https://www.legislation.gov.uk/uksi/2019/527/contents/made)

The Invasive Alien Species (Enforcement and Permitting) Order applies principally in England and Wales and the UK's offshore marine area, but also controls imports and exports from the UK (including Scotland and Northern Ireland). It lists species of concern which cannot be imported, kept, bred/grown, transported, sold, used, allowed to reproduce, or released into the

12 https://webarchive.nationalarchives.gov.uk/ukgwa/20140712055944/http:/www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx

environment. This Order replaces some elements relating to invasive species in the Wildlife and Countryside Act 1981 (as amended).

National, regional and local policy and guidance of relevance

Planning policy relating to ecology and nature conservation is set out below.

National Planning Policy Framework 2021

Access via: https://www.gov.uk/government/publications/national-planning-policy-framework--2

The National Planning Policy Framework (NPPF) sets out the Government's planning policy in England at the national level. It does not contain specific policies for nationally significant infrastructure projects, which are determined in accordance with the decision-making framework in the Act and relevant National Policy Statements for major infrastructure, as well as any other matters that are relevant (which may include the NPPF). Section 15 (paragraphs 174-188) of the NPPF specifies the requirements for conserving and enhancing the natural environment through the planning and development process to minimise impacts on habitats and biodiversity.

Planning Practice Guidance

Accessed via: https://www.gov.uk/government/collections/planning-practice-guidance

The Planning Practice Guidance is a web-resource to support the NPPF, including guidance for Environmental Impact Assessments (https://www.gov.uk/guidance/environmental-impact-assessment) and the Natural Environment (https://www.gov.uk/guidance/natural-environment). The guidance for the Natural Environment explains key issues in implementing the NPPF to protect and enhance the natural environment, including local requirements. The guidance outlines what evidence needs to be taken into account in preparing planning applications to identify and map local ecological networks. It also outlines how biodiversity can be taken into account in preparing a planning application.

Government's 25-Year Environment Plan 2018

Accessed via: https://www.gov.uk/government/publications/25-year-environment-plan

The Government's 25-Year Environment Plan 2018 sets out how the UK Government intends to improve the natural health of the UK through improving land, air and water quality, as well as setting out how the effects of climate change will be tackled. The plan promotes the creation or restoration of wildlife-rich habitat outside the protected site network and seeks to recover threatened, iconic or economically important species of animals, plants and fungi, and where possible to prevent human induced extinction or loss of known threatened species in England. The plan sets out a number of goals and corresponding policies that look at managing land sustainably, improving and enhancing landscapes and biodiversity for both marine and terrestrial environments, improving resource efficiency and reducing waste and pollution, whilst also examining the UK's contribution to improving the global environment.

APPENDIX C – PROTECTED AND NOTEWORTHY SPECIES RECORDS

Table 7 displays protected species records that are located within 1 km of the site boundary and Table 8 displays notable species records within 1km of the site boundary. These species records were obtained from the North & East Yorkshire Ecological Data Centre. The scientific and common names for species are given as well as their level of designation. A glossary defining abbreviations used in the table is given in Table 9, Appendix D. If a species is not included in the table below it does not necessarily mean the species is absent from the search area, but that data-holding organisations do not have records of it in these locations.

Table 7: Protected species records within 1 km of the site boundary

Latin Name	Common Name	Designation	Most Recent	Any Records in 100m
Amphibians				
Triturus cristatus	great crested newt	EPS(Sch2), WCA5, S41	2016	
Birds				
Anser anser	greylag goose	WCA1.2, Amber	2009	
Bucephala clangula	goldeneye	WCA1.2, Red, GB RDB(VU)	2018	
Cettia cetti	Cetti's warbler	WCA1.1	2019	
Falco subbuteo	hobby	WCA1.1	2012	
Numenius phaeopus	whimbrel	WCA1.1, Red, GB RDB(CR)	2007	
Tringa ochropus	green sandpiper	WCA1.1, Amber, GB RDB(EN)	2012	
Tyto alba	barn owl	WCA1.1	2016	
Mammals				
Arvicola amphibius	European water vole	WCA5, S41, GB RDB(EN)	2006	☒
Lutra lutra	Eurasian otter	EPS(Sch2), WCA5, S41	2005	☒
Meles meles	Eurasian badger	BA	2011	☒
Myotis mystacinus	whiskered bat	EPS(Sch2), WCA5	2016	
Pipistrellus sp.	a pipistrelle bat	EPS(Sch2), WCA5	1994	
Pipistrellus pipistrellus	common pipistrelle	EPS(Sch2), WCA5	2017	☒
Plecotus auritus	brown long-eared bat	EPS(Sch2), WCA5, S41	2014	
Vespertilionidae	unidentified bat	EPS(Sch2), WCA5	1986	☒
Reptiles				
Natrix helvetica	grass snake	WCA5, S41	2011	☒

Table 8: Noteworthy species records within 1km of the site boundary

Latin Name	Common Name	Designation
Amphibians		
Bufo bufo	common toad	WCA5, S41
Rana temporaria	common frog	WCA5
Birds		
Alauda arvensis	skylark	S41, Red
Anas crecca	teal	Amber
Anas platyrhynchos	mallard	Amber
Anser brachyrhynchus	pink-footed goose	Amber
Apus apus	swift	Red, GB RDB(EN)
Delichon urbicum	house martin	Red, GB RDB(VU)
Emberiza citrinella	yellowhammer	S41, Red
Emberiza schoeniclus	reed bunting	S41, Amber
Falco tinnunculus	kestrel	Amber, GB RDB(VU)
Gallinago gallinago	snipe	Amber
Gallinula chloropus	moorhen	Amber, GB RDB(VU)
Haematopus ostralegus	oystercatcher	Amber
Numenius arquata	curlew	S41, Red, GB RDB(EN)
Phylloscopus trochilus	willow warbler	Amber
Podiceps grisegena	red-necked grebe	Red, GB RDB(CR)
Scolopax rusticola	woodcock	Red, GB RDB(VU)
Tadorna tadorna	shelduck	Amber, GB RDB(EN)
Tringa totanus	redshank	Amber, GB RDB(VU)
Troglodytes troglodytes	wren	Amber
Vanellus vanellus	lapwing	S41, Red, GB RDB(EN)
Fish		
Anguilla anguilla	European eel	S41, OSPAR
Salmo trutta	brown / sea trout	S41
Invertebrates		
Agrochola litura	brown-spot pinion	S41
Amphipyra tragopoginis	mouse moth	S41
Apamea remissa	dusky brocade	S41
Arctia caja	garden tiger	S41
Caradrina morpheus	mottled rustic	S41
Ceramica pisi	broom moth	S41
Coenagrion hastulatum	northern damselfly	GB RDB(EN)
Diarsia rubi	small square-spot	S41
Ecliptopera silaceata	small phoenix	S41
Hoplodrina blanda	rustic	S41
Hydraecia micacea	rosy rustic	S41
Lasiommata megera	wall	S41
Satyrium w-album	white-letter hairstreak	WCA5, S41, GB RDB(EN)
Spilosoma lubricipeda	white ermine	S41
Timandra comae	blood-vein	S41
Tyria jacobaeae	cinnabar	S41

Latin Name	Common Name	Designation
Mammals		
Erinaceus europaeus	West European hedgehog	S41, GB RDB(VU)
Lepus europaeus	brown hare	S41
Micromys minutus	harvest mouse	S41
Plants		
Anacamptis morio	Green-winged orchid	GB RDB(VU), ENG BSBI RDB(VU)
Apium inundatum	Lesser marshwort	GB RDB(VU), ENG BSBI RDB(VU)
Bromus secalinus	Rye brome	NS
Calamagrostis canescens x stricta = C. x gracilescens	Small-reed	GB RDB(VU), NR
Carex vesicaria	Bladder-sedge	GB RDB(VU), ENG BSBI RDB(VU)
Catabrosa aquatica	Whorl-grass	GB RDB(VU), ENG BSBI RDB(VU)
Centaurea cyanus	Cornflower	S41
Cichorium intybus	Chicory	GB RDB(VU), ENG BSBI RDB(VU)
Coeloglossum viride	Frog orchid	S41, GB RDB(VU), ENG BSBI RDB(VU)
Euphorbia exigua	Dwarf spurge	GB RDB(VU), ENG BSBI RDB(VU)
Galeopsis speciosa	Large-flowered hemp-nettle	GB RDB(VU), ENG BSBI RDB(VU)
Glebionis segetum	Corn marigold	GB RDB(VU), ENG BSBI RDB(VU)
Groenlandia densa	Opposite-leaved pondweed	GB RDB(VU), ENG BSBI RDB(VU)
Hottonia palustris	Water-violet	GB RDB(VU), ENG BSBI RDB(VU)
Hyacinthoides non-scripta	Bluebell	WCA8
Myriophyllum verticillatum	Whorled water-milfoil	GB RDB(VU)
Oenanthe fistulosa	Tubular water-dropwort	S41, GB RDB(VU), ENG BSBI RDB(VU)
Pinus sylvestris	Scots pine	NS
Potamogeton friesii	Flat-stalked pondweed	GB RDB(VU), ENG BSBI RDB(VU), NS
Ranunculus arvensis	Corn buttercup	S41, GB RDB(CR), ENG BSBI RDB(EN)
Ranunculus flammula	Lesser spearwort	GB RDB(VU), ENG BSBI RDB(VU)
Sium latifolium	Greater water-parsnip	S41, GB RDB(EN), ENG BSBI RDB(EN), NS
Spergula arvensis	Corn spurrey	GB RDB(VU), ENG BSBI RDB(VU)
Valerianella dentata	Narrow-fruited cornsalad	GB RDB(EN), ENG BSBI RDB(EN)

APPENDIX D – ABBREVIATIONS

Table 9: Glossary of abbreviations used in this report

Code	Full Title	Explanation
Amber	Amber list	Amber listed species have a population status in the UK of medium conservation concern.
BAP	Biodiversity action plan	A plan that identifies threats to significantly important species and habitats, and sets out targets and actions to enhance or maintain biodiversity.
ENG BSBI RDB	A Vascular Plant Red List for England	A list published in 2014 by the Botanical Society of Britain and Ireland of the red list status of plants in England. Measured against standardised IUCN criteria.
ENG BSBI RDB(CR)	Critically endangered	A BSBI Red List designation for species at an extremely high risk of extinction.
ENG BSBI RDB(EN)	Endangered	A BSBI Red List designation for species at a very high risk of extinction.
ENG BSBI RDB(VU)	Vulnerable	A BSBI Red List designation for species at high risk of extinction.
EPS (Sch 2)	European protected species (Schedule 2)	European protected species of animals, listed on Schedule 2 of The Conservation of Habitats and Species Regulations 2017.
EPS (Sch 5)	European protected species (Schedule 5)	European protected species of plants, listed on Schedule 5 of The Conservation of Habitats and Species Regulations 2017.
GB RDB	Red data book species	Species identified in one of the UK Red Data 2001.
GB RDB(CR)	Critically endangered	An IUCN Red List designation for species at an extremely high risk of extinction.
GB RDB(EN)	Endangered	An IUCN Red List designation for species at a very high risk of extinction.
GB RDB(VU)	Vulnerable	An IUCN Red List designation for species at high risk of extinction.
HAP	Habitat action plan	A plan that identifies threats to a priority habitat and sets out targets and actions to enhance or maintain that habitat.
IUCN	International Union for Conservation of Nature and Natural Resources	A worldwide partnership and conservation network to influence, encourage and assist societies throughout the world to conserve the integrity and diversity of nature and to ensure that any use of natural resources is equitable and ecologically sustainable.
LBAP	Local biodiversity action plan	A plan that identifies threats to locally important species and habitats, and sets out targets and actions in Species Action Plans and Habitat Action Plans to enhance or maintain biodiversity at the county or regional level.
Notable	Scarce and threatened invertebrates	Invertebrate species which are estimated to occur within the range of 16 to 100 10km squares but subdivision into Notable A and Notable B categories is not possible as there is insufficient information available).
Notable: A	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories but which are none-the-less uncommon in Great Britain and thought to occur in 30 or fewer 10km squares of the National Grid or, for less well-recorded groups, within seven or fewer vice-counties.
Notable: B	Scarce and threatened invertebrates	Taxa which do not fall within Red Data Book categories but which are none-the-less uncommon in Great Britain and thought to occur in between 31 and 100 10km squares of the National Grid or, for less-well recorded groups between eight and twenty vice-counties.
NN	Nationally notable	Designation for invertebrate taxa that are thought to be notably important in the UK.
NR	Nationally rare	Species in 15 or fewer hectads in Great Britain.
NS	National scarce	Species in 16-100 hectads in Great Britain.
OSPAR	OSPAR	Species listed on The Convention for the Protection of the Marine Environment of the North-East Atlantic
Red	Red list	Red listed species have a population status in the UK with high conservation concern.
SAP	Species action plan	A plan that identifies threats to significantly important species, and sets out targets and actions to prevent losing that species to extinction.

Code	Full Title	Explanation
S41	Species of principal importance	Species of Principal Importance in England under The Natural Environment and Rural Communities (NERC) Act (2006)
UKBAP	UK biodiversity action plan	A plan that identifies threats to locally important species and habitats, and sets out targets and actions in species action plans and habitat action plans to enhance or maintain biodiversity in the UK.
WCA	The Wildlife and Countryside Act 1981 (as amended)	Containing 4 Parts and 17 Schedules, the Act covers protection of wildlife (birds, and some animals and plants), the countryside, National Parks, and the designation of protected areas, and public rights of way.
WCA1	Schedule 1 of The Wildlife and Countryside Act 1981 (as amended)	This Schedule lists birds protected by special penalties at all times, but virtually all wild birds have some protection in law. Acts which are prohibited for all wild birds (except derogated 'pest' species) include intentional killing, injuring or taking; taking, damaging or destroying nests in use or being built; taking or destroying eggs; possessing or having control of (with certain exceptions but including live for dead birds, parts or derivative); setting or permitting certain traps, weapons, decoys or poisons. Selling, offering or exposing for sale, possessing or transporting for sale any live wild bird, egg or part of an egg or advertising any of these for sale, or dead wild bird including parts or derivatives are also prohibited. Many birds must be formally registered and ringed if kept in captivity. Schedule I WCA birds are additionally protected from intentional or reckless disturbance while building a nest, or when such a bird is in, on or near a nest containing eggs or young, or intentional or reckless disturbance of dependent young.
WCA5	Schedule 5 of The Wildlife and Countryside Act 1981 (as amended)	Schedule 5 animals are protected from intentional killing, injuring or taking; possessing (including parts or derivatives); intentional or reckless damage, destruction or obstruction of any structure or place used for shelter or protection; selling, offering or exposing for sale, possessing or transporting for the purpose of sale (alive or dead, including parts or derivatives). Protection of some species is limited to certain Sections of the Act (*e.g.* S9(1), S9(4a), S9(4b), S9(5)).
WCA8	Schedule 8 of The Wildlife and Countryside Act 1981 (as amended)	Plants and fungi protected from intentional picking, uprooting, destroying, trading (including parts or derivatives), *etc*.

APPENDIX E – GCN EDNA ANALYSIS RESULTS

Client: Lewis Wright,
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Email: Helen.Rees@adas.co.uk

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Sample ID: ADAS-34	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 2 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	21/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	21/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	21/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	[redacted]
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-35	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 1- Arnold & Riston Drain	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	21/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	21/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	21/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-36	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Ditch 1.03 Holderness Drain North	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	0 of 2	Real Time PCR	21/06/2023
Degradation Control[§]	Evidence of degradation or residual inhibition	Real Time PCR	21/06/2023
Great Crested Newt*	Indeterminate	Real Time PCR	21/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-37	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Ditch 1.01 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	0 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Evidence of degradation or residual inhibition	Real Time PCR	20/06/2023
Great Crested Newt*	Indeterminate	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

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[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-38	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: Ditch 1.02 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Evidence of degradation	Real Time PCR	20/06/2023
Great Crested Newt*	Indeterminate	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN
Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-39	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 1.04 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

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[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-40	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 1.05 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
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Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-42	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: Pond B Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-46	Condition on Receipt: Good	Volume: Passed
Client Identifier: Ditch 1.07 Meaux west drain	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-47	Condition on Receipt: White Precipitate	Volume: Passed
Client Identifier: Ditch 1.06 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	21/06/2023
Degradation Control[§]	Evidence of degradation	Real Time PCR	21/06/2023
Great Crested Newt*	Indeterminate	Real Time PCR	21/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-48	Condition on Receipt: Good	Volume: Passed
Client Identifier: Pond A Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

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Sample ID: ADAS-553	Condition on Receipt: Good	Volume: Passed
Client Identifier: Rolth&Meaux Drain	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

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[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

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Sample ID: ADAS-554	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: Ditch B Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
Inhibition Control[†]	2 of 2	Real Time PCR	20/06/2023
Degradation Control[§]	Within Limits	Real Time PCR	20/06/2023
Great Crested Newt*	0 of 12 (GCN negative)	Real Time PCR	20/06/2023
Negative PCR Control (Nuclease Free Water)	0 of 4	Real Time PCR	As above for GCN
Positive PCR Control (GCN DNA 10^{-4} ng/µL)[#]	4 of 4	Real Time PCR	As above for GCN

Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
Signed:	[redacted]	Signed:	
Position:	Director: Biotechnology	Position:	MD: Biotechnology
Date of preparation:	21/06/2023	Date of issue:	21/06/2023

eDNA analysis was carried out in accordance with the stipulated methodology found in the Technical Advice Note (WC1067 Appendix 5 Technical Advice Note) published by DEFRA and adopted by Natural England.

** If all PCR controls and extraction blanks give the expected results a sample is considered: negative for great crested newt if all of the replicates are negative; positive for great crested newt if one or more of the replicates are positive.*

[†] Recorded as the number of positive replicate reactions at expected C_t value. If the expected C_t value is not achieved, the sample is considered inhibited and is diluted as per the technical advice note prior to amplification with great crested newt primer and probes.

[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Client: Lewis Wright,
RSK Biocensus

ADAS
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Sample ID: ADAS-555	Condition on Receipt: Low Sediment	Volume: Passed
Client Identifier: Pond 2 Peartree hill solar	Description: pond water samples in preservative	
Date of Receipt: 16/06/2023	Material Tested: eDNA from pond water samples	

Determinant	**Result**	**Method**	**Date of Analysis**
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Report Prepared by:	Dr Helen Rees	Report Issued by:	Dr Ben Maddison
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[§] No degradation is expected within time frame of kit preparation, sample collection and analysis.

[#]Additional positive controls (10^{-1}, 10^{-2}, 10^{-3} ng/µL) are also routinely run, results not shown here.

Appendix 1: Interpretation of results

Sample Condition

Upon sample receipt we score your samples according to quality: good, low sediment, medium sediment, high sediment, white precipitate, and presence of algae.

There are three reasons as to why sediment should be avoided:

1. It is possible for DNA to persist within the sediment for longer than it would if it was floating in the water which could lead to a false positive result i.e. in this case GCN not recently present but present a long time ago
2. In some cases sediment can cause inhibition of the PCR analysis used to detect GCN eDNA within samples which could lead to an indeterminate result.
3. In some cases sediment can interfere with the DNA extraction procedure resulting in poor recovery of the eDNA which in turn can lead to an indeterminate result.

Algae can make the DNA extraction more difficult to perform so if it can be avoided then this is helpful.

Sometimes samples contain a white precipitate which we have found makes the recovery of eDNA very difficult. This precipitate can be present in such high amounts that it interferes with the eDNA extraction process meaning that we cannot recover the degradation control (nor most likely the eDNA itself) at sufficient levels for the control to be within the acceptable limits for the assay, therefore we have to classify these type of samples as indeterminate.

What do my results mean?

A positive result means that great crested newts are present in the water or have been present in the water in the recent past (eDNA degrades over around 7-21 days).

A negative result means that DNA from the great crested newt has not been detected in your sample.

On occasion an inconclusive result will be issued. This occurs where the DNA from the great crested newt has not been detected but the controls have indicated that either: the sample has been degraded and/or the eDNA was not fully extracted (poor recovery); or the PCR inhibited in some way. This may be due to the water chemistry or may be due to the presence of high levels of sediment in samples which can interfere with the DNA extraction process. A re-test could be performed but a fresh sample would need to be obtained. We have successfully performed re-tests on samples which have had high sediment content on the first collection and low sediment content (through improved sample collection) on the re-test. If water chemistry was the cause of the indeterminate then a re-test would most likely also return an inconclusive result.

The results will be recorded as indeterminate if the GCN result is negative and the degradation result is recorded as:

1. evidence of decay - meaning that the degradation control was outside of accepted limits
2. evidence of degradation or residual inhibition - meaning that the degradation control was outside of accepted limits but that this could have been due to inhibitors not being removed sufficiently by the dilution of inhibited samples (according to the technical advice note)

APPENDIX F – GLTA RESULTS

Table 10. Ground-level tree assessment results

NB: Tree numbers can refer to more than one tree. Also, several areas of the site had expansive areas (or lines) of trees with multiple species. No attempt was made to sum up the bat-roosting potential of all of these trees, so they were not given an ID and are not included here.

Tree	Tree Species	Number	Age	Potential roosting features (PRFs)	Roosting Potential	Safe to Climb
T1	Pedunculate Oak (*Quercus robur*)	1	Semi-mature	Areas of damage obscured by vegetation	Low	Safe
T2	Pedunculate Oak	1	Mature	Broken limbs and rot holes but obscured by vegetation	Moderate	Safe
T3	Pedunculate Oak	1	Semi-mature	Areas of damage obscured by vegetation	Low	Safe
T4	Pedunculate Oak	1	Semi-mature	Areas of damage obscured by vegetation	Low	Safe
T5	Pedunculate Oak	1	Semi-mature	Damaged and lifted bark, callus rolls	Moderate	Safe
T6	Ash (*Fraxinus excelsior*)	1	Mature	Large trunk cavity on western side	Moderate	No
T7	Ash	1	Mature	Hollow trunk	Moderate	No
T8	Ash	1	Mature	Large trunk cavity with multiple entrances on eastern side	High	Safe
T9	Ash	1	Mature	Trunk with major damage but regrowing. Also with owl box*	Low*	Safe
T10	Beech (*Fagus sylvatica*)	1	Semi-mature	Broken limb	Moderate	No
T11	Pedunculate Oak	>2	Mature	Multiple possible features, adjacent trees also with features	Moderate	No
T12	Ash	2	Mature	Two trees, both with multiple woodpecker holes and dead branches. features north-facing.	Moderate	No
T13	Pedunculate Oak	>2	Mature	Line of more mature trees, multiple features including tearouts and dead limbs with cavities	Moderate	Safe
T14	Pedunculate Oak	>2	Mature	Multiple mature trees within woodland strip with potential features. some knotholes facing into the field.	Moderate	Safe
T15	Willow (*Salix* sp.)	1	Dead	Flaking bark	Moderate	No
T16	Ash	1	Semi-mature	Knothole in trunk, possibly more not visible due to vegetation	Moderate	Safe
T17	Ash	1	Semi-mature	Dead branches and knotholes	Moderate	Safe
T18	Pedunculate Oak	2	Mature	Two trees both with possible knotholes & dead branches, obscured by vegetation.	Moderate	Safe
T19	Pedunculate Oak	1	Mature	Knotholes and dead branches in canopy	Moderate	Safe

T20	Pedunculate Oak	1	Mature	Multiple dead branches and knotholes in branches	Moderate	No
T21	Pedunculate Oak	1	Mature	Flaking bark visible from ground, possibly more hidden by foliage	Low	No
T22	Ash	2	Semi-mature	Two Ivy-covered trees, view obscured by Ivy and adjacent ditch preventing access	Low	No
T23	Ash	1	Mature	Knotholes and cracks visible	Moderate	No
T24	Pedunculate Oak	1	Semi-mature	Dead branches, flaking bark and Ivy	Moderate	No
T25	Pedunculate Oak	1	Dieing	Mostly dead with flaking bark and Ivy	Moderate	No
T26	Pedunculate Oak	1	Mature	Dead limbs, flaking bark, tear-outs	Moderate	No
T27	Ash	1	Semi-mature	Crevice between two merged stems	Low	Safe
T28	Pedunculate Oak	1	Mature	Multiple knotholes on branches and dead section with flaking bark	Moderate	Safe
T29	Ash	1	Mature	Multiple large knotholes and tear-out	Moderate	Safe
T30	Pedunculate Oak	1	Mature	Dead sections, knotholes in branches	Moderate	No
T31	Ash	1	Mature	Area of flaking bark on dead section	Low	No
T32	Pedunculate Oak	3	Mature	Three ivy-covered trees with dead sections and knotholes	Moderate	No
T33	Ash	>2	Mature	Line of trees in corner of field with knotholes and tear-outs	Moderate	Safe
T34	Ash	1	Mature	No obvious features but covered in Ivy	Low	Safe
T35	Alder (*Alnus glutinosa*)	1	Semi-mature	Severely damaged, no clear features other than peeling bark but dense bramble preventing full assessment	Low	Safe
T36	Pedunculate Oak	1	Mature	Flaking bark and snapped limbs with potential features (obscured by dense leaves and epicormic growth)	Moderate	Safe
T37	Pedunculate Oak	1	Mature	Flaking bark, slightly cracked limbs and partly hollowed trunk with potential access *c.*1.2 m up trunk	Moderate	Safe
T38	Pedunculate Oak	1	Mature	Flaking bark, snapped limbs but only very minor features. Also bird nests.	Low	Safe
T39	Pedunculate Oak	1	Mature	Flaking bark, minor limbs with small splits	Low	Safe
T40	Pedunculate Oak	1	Mature	A few minor features, but only one side visible (partly safe to climb)	Low	No
T41	Pedunculate Oak	1	Mature	Visibility limited but at least flaking bark and minor cracks/tears in multiple limbs	Moderate	Safe
T42	Ash	1	Semi-mature	Dead branches and knotholes	Moderate	Safe
T43	Unknown	1	Dead	Knotholes and Ivy cover	Moderate	No

T44	Ash	1	Semi-mature	Multiple knotholes and crevices in branches	Moderate	Safe
T45	Ash	>2	Semi-mature	Line of trees with various features – farmer pruning and knotholes	Moderate	No
T46	Ash	1	Semi-mature	Knotholes and multiple features in dead limbs	Moderate	No
T47	Ash	1	Semi-mature	Dead-wood remains of broken second stem. Upward facing cavity visible from field, other side not visible.	Low	No
T48	Ash	1	Semi-mature	Possible woodpecker hole on west side, smaller broken branches with possible cavities	Low	Safe
T49	Ash	1	Mature	Multiple features. Knotholes in dead branches, farmer pruned. Two tear-outs with possible cavities.	Moderate	No
T50	Pedunculate Oak	1	Semi-mature	Broken bird box and dead branches at top.	Moderate	No
T51	Beech	1	Mature	Two large tear-outs in stem	Moderate	No
T52	Ash	2	Semi-mature	Two trees along boundary, both with broken branches and Ivy	Low	No
T53	Ash	1	Mature	Broken limb with features possible but obscured. Fungus at base and within tree. Smaller broken branches with possible features at ends.	Moderate	No
T54	Ash	1	Mature	Knotholes in stem and cavity at base. possible tear-out further up.	Moderate	Safe

APPENDIX G LANDSCAPE AND VISUAL FIGURES

Legend:

- Site Boundary
- Potential Areas for Solar PV Modules
- Proposed LVIA Study Area

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	01/11/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

TITLE: Figure 1
LVIA Scoping Study Area

ID:Figure 1 LVIA Scoping Study Area

0 1 2
Kilometres
Scale: 1:62,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 500s - 0589 - Peartree Solar Farm DCO\05 Working Files\03 GIS\P663880\P663880.aprx\Figure 1 LVIA Scoping Study Area

Legend:

- Site Boundary
- Distance Radii from Fields hosting Solar PV Modules (1, 2, 3km)

East Riding Landscape Character Assessment (2005)

- 13B Bishsop Burton Estate Farmland
- 13C South Wolds Rolling Farmland
- 16B Kilnwick Percy Wooded Farmland
- 16C Beverley Westwood
- 16E Lund Sloping Farmland
- 16F Beverley Parks Farmland
- 17A Headon, Preston & Bilton Farmland
- 17B North Cottingham Farmland
- 18A River Hull Corridor
- 18B Quarry Farmland
- 18C Catfoss Dyke
- 18D Hornsea Mere
- 18F Figham & Swine Moor Common
- 19A Rise Parkland
- 19B Burton Constable Farmland & Parkland
- 19C North Holderness Open Farmland
- 19D Central Holderness Open Farmland
- 20C Bridlington to Hornsea Coast

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	01/11/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

TITLE: Figure 2
LVIA Scoping Landscape Character Areas

ID:Figure 2 LCA

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Kilometres
Scale: 1:60,000 @ A3

REV 00

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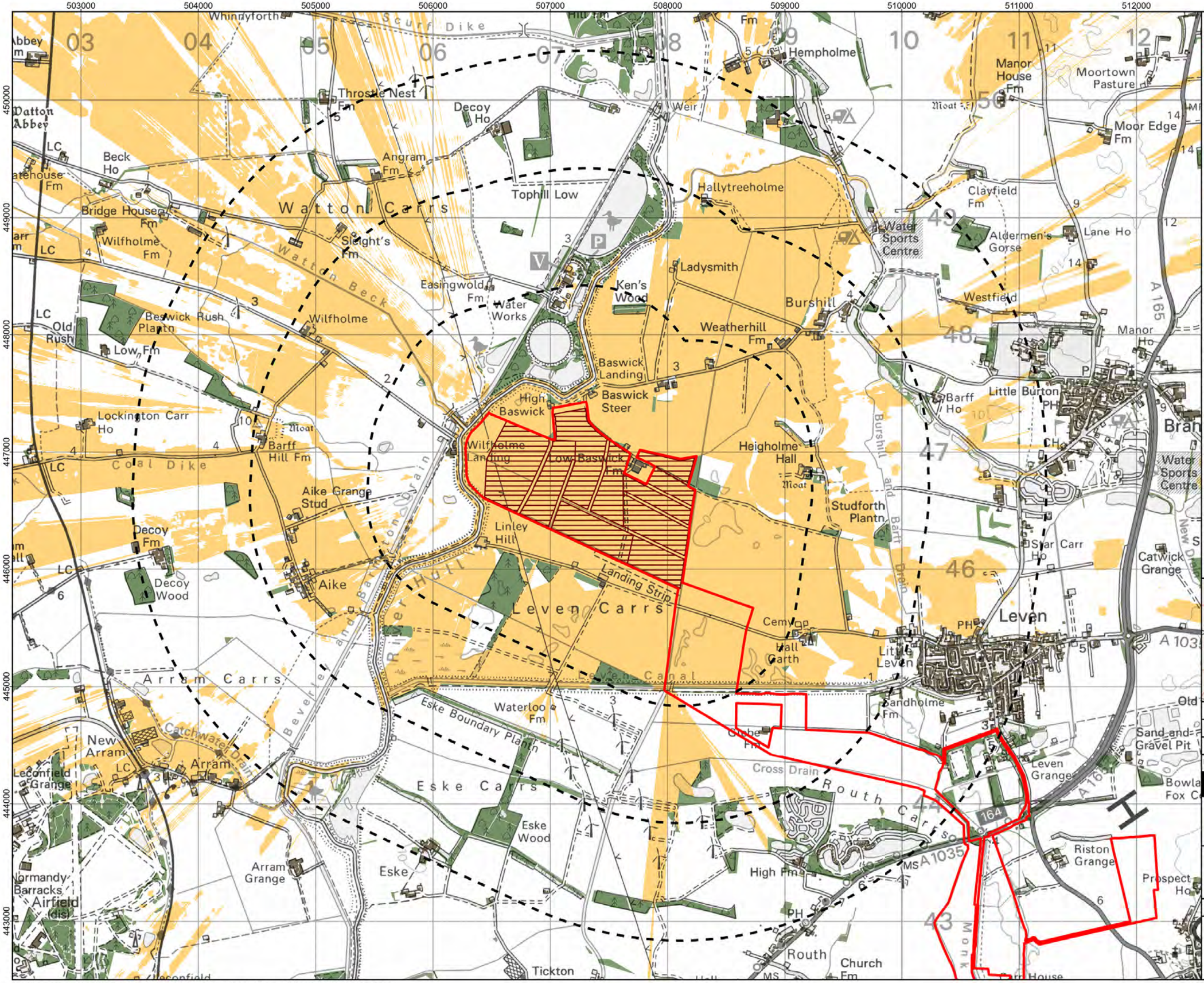

Legend:

- Site Boundary
- Potential Areas for Solar PV Modules
- Distance Radii from Fields hosting Solar PV Modules (1, 2, 3km)
- Existing Woodland (modelled at 10m)
- Existing Buildings (modelled at 7.5m)

Value

- Solar PV Modules may be visible

FIGURE DATA:
This figure has been based on the following data:

Layout file: D001-obvs-panels3_5m-LiDAR5m-3km.shp
Terrain data: LiDAR-2022-5m-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m

NOTES:
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from National LiDAR Programme 2022 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Buildings have been modelled with an assumed height of 7.5m and woodland an assumed height of 10m, representing a conservative estimate of average heights within the study area.
The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	01/11/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

TITLE: Figure 3a
LVIA Scoping ZTV Field Parcels A1-A11

ID:Figure 3a ZTV A1-A11

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Kilometres
Scale: 1:30,000 @ A3

REV 00

Path: C:\Users\mo.pampin.RSK\HELSBY\RSK Group\SH Projects 500s - 0589 - Peartree Solar Farm DCO\05 Working Files\03 GIS\P663880\P663880.aprx\Figure 3a ZTV A1-A11

505000 506000 507000 508000 509000 510000 511000 512000 513000 514000 515000 516000 517000

446000 445000 444000 443000 442000 441000 440000 439000 438000 437000 436000

Hill Fm · Aike Grange Stud · Landing · Low Baswick Fm · Hall · Water Sports Centre · Sand and Gravel Pits · Seaton · PH · Manor Fm · Wassand Hall

Linley Hill · Aike · Landing Strip · Studforth Plantn · Barmston Drain · Star Carr Ho · Catwick Grange · Sandsfield Fm · Catfoss Hall Fm · Leven Carrs · River Hull · Beverley and Barmston Drain

Leven · Catwick Ho · A 1035 · Catwick · Sigglesthorne · Stud Fm · The Hall · B1243

Carrs · Cemy · Hall Garth · PH · Little Leven · Waterloo Fm · Eske Boundary Plantn · Sandholme Fm · Cobble Hall · Old Hall · Pasture Ho · Sigglesthorne Grange · Stream Dike

Sand and Gravel Pit · Little Catwick · Field Ho · Huddlecross Plantn · Bowlams Fox Cover · Leven Grange · Cross Drain · Routh Carrs · Eske Carrs · Eske Wood · Arram Grange · Eske · High Fm · A1035 MS · Riston Grange · Prospect Ho · Riston Whins Ho · Criftins Fm · Mill Ho

Routh · Church Fm · Manor Ho · Long Riston · Farnton Hill · North Fm · Rise · Rise Grange · Rise Hall · Mote Hill · Tickton Grange (Hotel) · Tickton Hall · Hall Fm · Manor House Fm · Old Hall Fm · Hull Bridge · Stork Hill Fm · Molescroft Grange · Tickton · Holderness Drain · Routh Carrs · Arnold · Arnold Grange · Ruddens · Rise Wood

Swine Moor Hospl · BEVERLEY · Meaux Abbey Fm · Meaux Decoy · The Decoy · North Grange Meaux · Corporation Fm · Arnold Carr · Woodhouse Fm · Rowton Fm · Rowton Villas · Hoggard House Fm · Weel Carr · Weel · Crown Fm · Meaux · Abbey Earthworks · Skirlaugh · Hazelmere · Langthorpe Hall · New Ellerby · Driffield · Hornsea · Beverley · South Cave · Hull · Hedon · Withernsea

Sewage Wks · Figham · Stone Carr · Spring Dale Fm · Wawne Common · Benningholme Grange · Benningholme Hall · Holyrood Ho · Wawne Grange · Carr Plantn · Carr Ho · Clayhill Plantn · Pasture Ho · Skirlaugh Grange · Dowthorpe Hall · Ellerby Grange · Woodmansey · Kenley House Fm · Kenley Reach Fm · Foxholme · Fairholme · New England · Old Ellerby · Beverley Parks Crossing · Hampston Hill · Wawne · Thearne · Great Stanks · Woodhouse Fm · Oubrough · Plaxton Br · Glebe Fm · Carlam Hill Fm · Kelwell Fm · Wood Hall · Model Fm · Halfway Ho · High House · Sicey Fm · Hill Fm

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Legend:

- Site Boundary
- Potential Areas for Solar PV Modules
- Distance Radii from Fields hosting Solar PV Modules (1, 2, 3km)
- Existing Woodland (modelled at 10m)
- Existing Buildings (modelled at 7.5m)

Zone of Theoretical Visibility (3.5m high Solar PV Modules)

- Solar PV Modules may be visible

FIGURE DATA:
This figure has been based on the following data:

Layout file: D001-obvs-panels3_5m-LiDAR5m-3km.shp
Terrain data: LiDAR-2022-5m-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m

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Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	01/11/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

TITLE: Figure 3b
LVIA Scoping ZTV Field Parcels
B1-B4, B7-B8, C1-C9

ID:Figure 3b ZTV B1-B4 B7-B8 C1-C8

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Kilometres
Scale: 1:40,000 @ A3

REV 00

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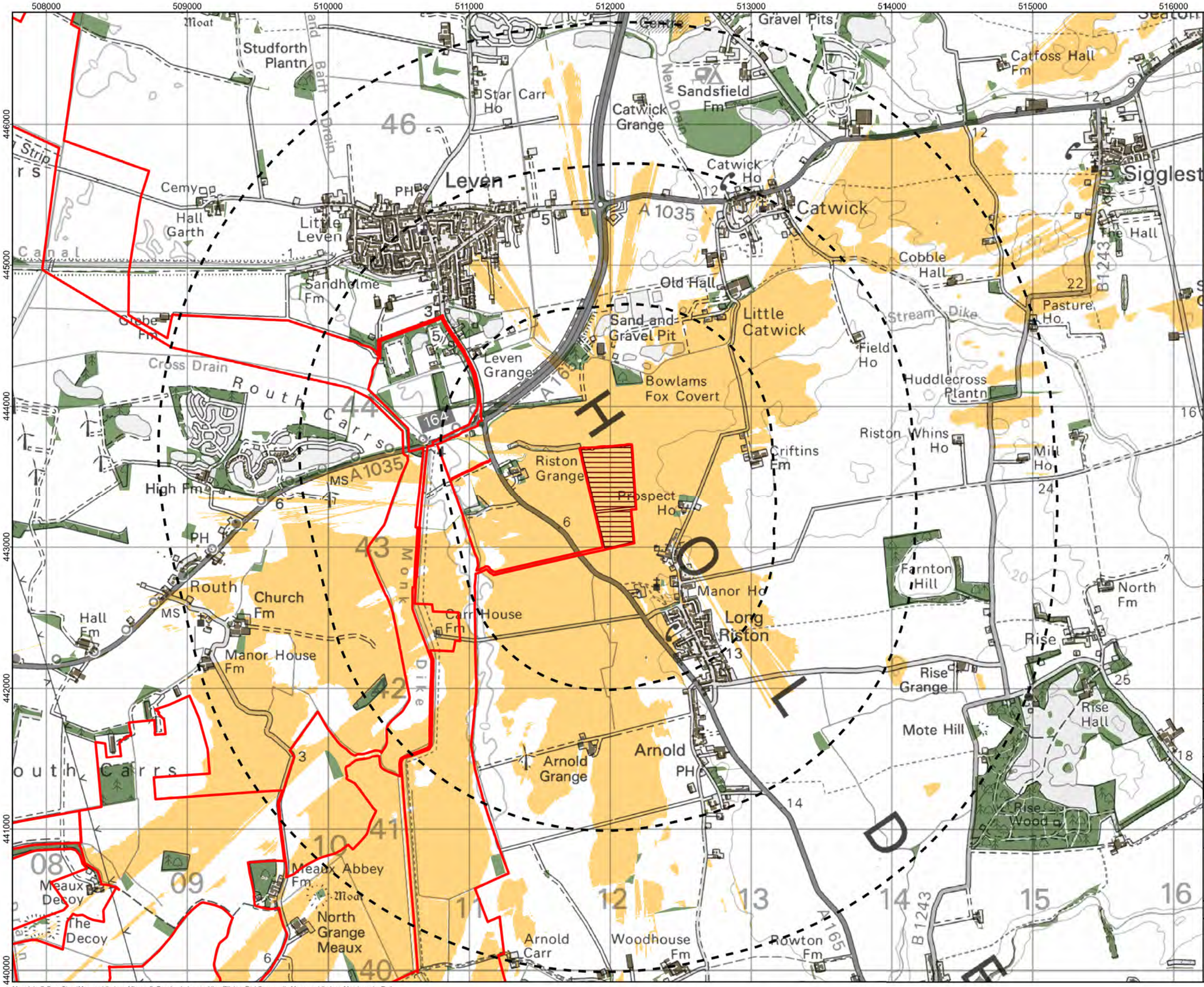

Legend:

- Site Boundary
- Potential Areas for Solar PV Modules
- Distance Radii from Fields hosting Solar PV Modules (1, 2, 3km)
- Existing Woodland (modelled at 10m)
- Existing Buildings (modelled at 7.5m)

Zone of Theoretical Visibility (3.5m high Solar PV Modules)

- Solar PV Modules may be visible

FIGURE DATA:
This figure has been based on the following data:

Layout file: D001-obvs-panels3_5m-LiDAR5m-3km.shp
Terrain data: LiDAR-2022-5m-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m

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Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	13/10/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

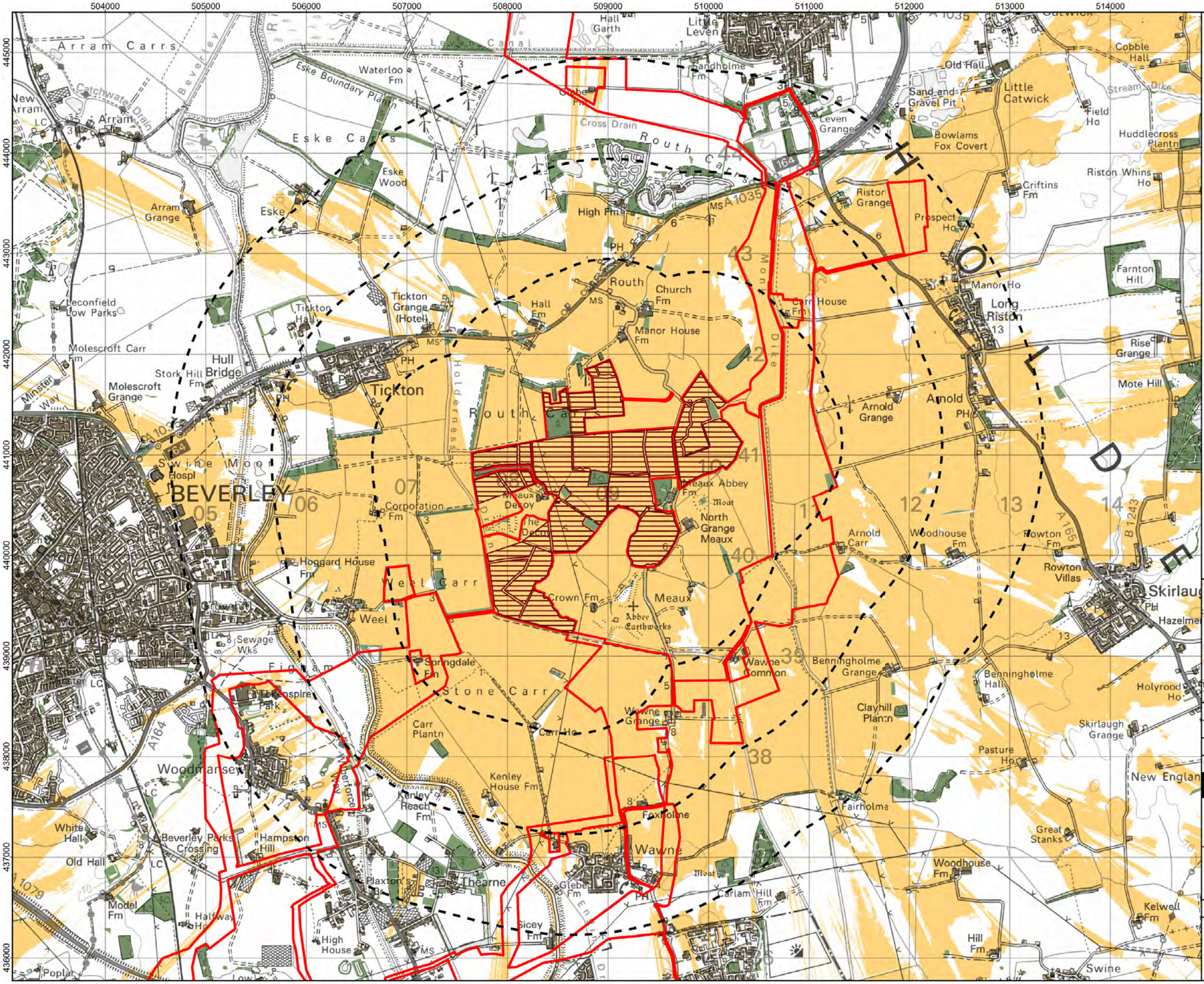
TITLE: Figure 3c
LVIA Scoping ZTV Field Parcels
B5-B6

ID:Figure 3c ZTV B5-B6

0 0.5 1
Kilometres
Scale: 1:25,000 @ A3

REV 00

Path: C:\Users\mc.pamplin.RSKHELSBY\RSK Group\SH Projects 500s - 0589 - Peartree Solar Farm DCO\05 Working Files\03 GIS\P663880\P663880.aprx\Figure 3c ZTV B5-B6



Legend:

- Site Boundary
- Distance Radii from Fields hosting Solar PV Modules (1, 2, 3km)
- Existing Woodland (modelled at 10m)
- Existing Buildings (modelled at 7.5m)

Zone of Theoretical Visibility (3.5m high Solar PV Modules)

- Solar PV Modules may be visible

FIGURE DATA:
This figure has been based on the following data:

Layout file: D001-obvs-panels3_5m-LiDAR5m-3km.shp
Terrain data: LiDAR-2022-5m-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m

NOTES:
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
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The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	08/11/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

TITLE: Figure 3d
LVIA Scoping ZTV Field Parcels
D1-D18, E1-E12

ID:Figure 3d ZTV D1-D18 E1-E12

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Kilometres
Scale: 1:35,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 500s - 0589 - Peartree Solar Farm DCO\05 Working Files\03 GIS\P663880\P663880.aprx\Figure 3d ZTV D1-D18 E1-E12

Legend:

- Site Boundary
- Potential Areas for Solar PV Modules
- Distance Radii from Fields hosting Solar PV Modules (1, 2, 3km)
- Existing Woodland (modelled at 10m)
- Existing Buildings (modelled at 7.5m)

Zone of Theoretical Visibility (3.5m high Solar PV Modules)

- Solar PV Modules may be visible

FIGURE DATA:
This figure has been based on the following data:

Layout file: D001-obvs-panels3_5m-LiDAR5m-3km.shp
Terrain data: LiDAR-2022-5m-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m

NOTES:
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from National LiDAR Programme 2022 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Buildings have been modelled with an assumed height of 7.5m and woodland an assumed height of 10m, representing a conservative estimate of average heights within the study area.
The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	01/11/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

TITLE: Figure 3e
LVIA Scoping ZTV Field Parcels E13-E17

ID:Figure 3e ZTV E13-E17

0 0.5 1
Kilometres
Scale: 1:30,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 500s - 0589 - Peartree Solar Farm DCO\05 Working Files\03 GIS\P663880\P663880.aprx\Figure 3e ZTV E13-E17

Legend:

- Site Boundary
- Potential Areas for Solar PV Modules
- Distance Radii from Fields hosting Solar PV Modules (1, 2, 3km)
- Existing Woodland (modelled at 10m)
- Existing Buildings (modelled at 7.5m)

Zone of Theoretical Visibility (3.5m high Solar PV Modules)

- Solar PV Modules may be visible

FIGURE DATA:
This figure has been based on the following data:

Layout file: D001-obvs-panels3_5m-LiDAR5m-3km.shp
Terrain data: LiDAR-2022-5m-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m

NOTES:
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from National LiDAR Programme 2022 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Buildings have been modelled with an assumed height of 7.5m and woodland an assumed height of 10m, representing a conservative estimate of average heights within the study area.
The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	01/11/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

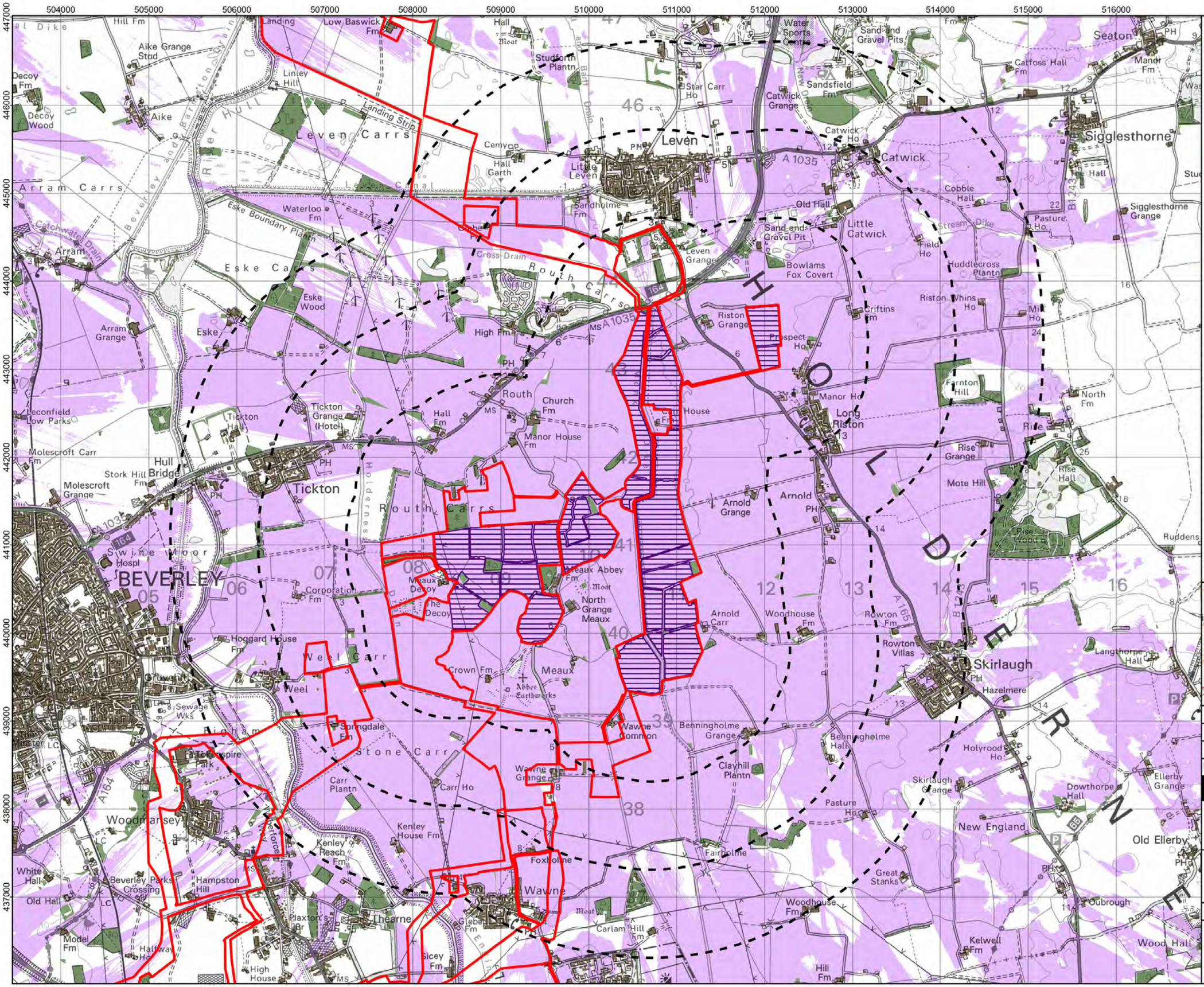
TITLE: Figure 3f
LVIA Scoping ZTV Field Parcels F1-F17

ID:Figure 3f ZTV F1-F17

0 0.5 1
Kilometres
Scale: 1:30,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSK\HELSBY\RSK Group\SH Projects 500s - 0589 - Peartree Solar Farm DCO\05 Working Files\03 GIS\P663880\P663880.aprx\Figure 3f ZTV F1-F17



Legend:

- Site Boundary
- Potential Areas for Substations
- Distance Radii from Fields hosting Potential Substations (1, 2, 3km)
- Existing Woodland (modelled at 10m)
- Existing Buildings (modelled at 7.5m)

Zone of Theoretical Visibility (15m high substations)

- Potential Substations may be visible

FIGURE DATA:
This figure has been based on the following data:

Layout file: D001-obvs-substations_15m-LiDAR5m-3km.shp
Terrain data: LiDAR-2022-5m-DSM.asc
Viewer's eye height: 2m above ground level
Calculation grid size: 5m

NOTES:
This drawing is based upon computer generated Zone of Theoretical Visibility (ZTV) studies produced using the Viewshed routine in the Visibility Analysis plugin for QGIS.
The areas shown are the maximum theoretical visibility, taking into account topography, principal woodlands and buildings.
A digital surface model (DSM) has been derived from National LiDAR Programme 2022 2m DTM height data with the locations of woodland and buildings taken from the OS Open Map Local dataset. Buildings have been modelled with an assumed height of 7.5m and woodland an assumed height of 10m, representing a conservative estimate of average heights within the study area.
The model does not take into account some localised features such as small copses, hedgerows or individual trees and therefore still gives an exaggerated impression of the extent of visibility. The actual extent of visibility on the ground will be less than that suggested by this plan.
The ZTV includes an adjustment that allows for Earth's curvature and light refraction. It is based on a derived DSM and has a 5m² resolution.

Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter

Rev	Date	Description	Drn	Chk	App
00	08/11/2023	First Draft	MP	ZF	

Peartree Hill Solar Farm

RSK JBM SOLAR

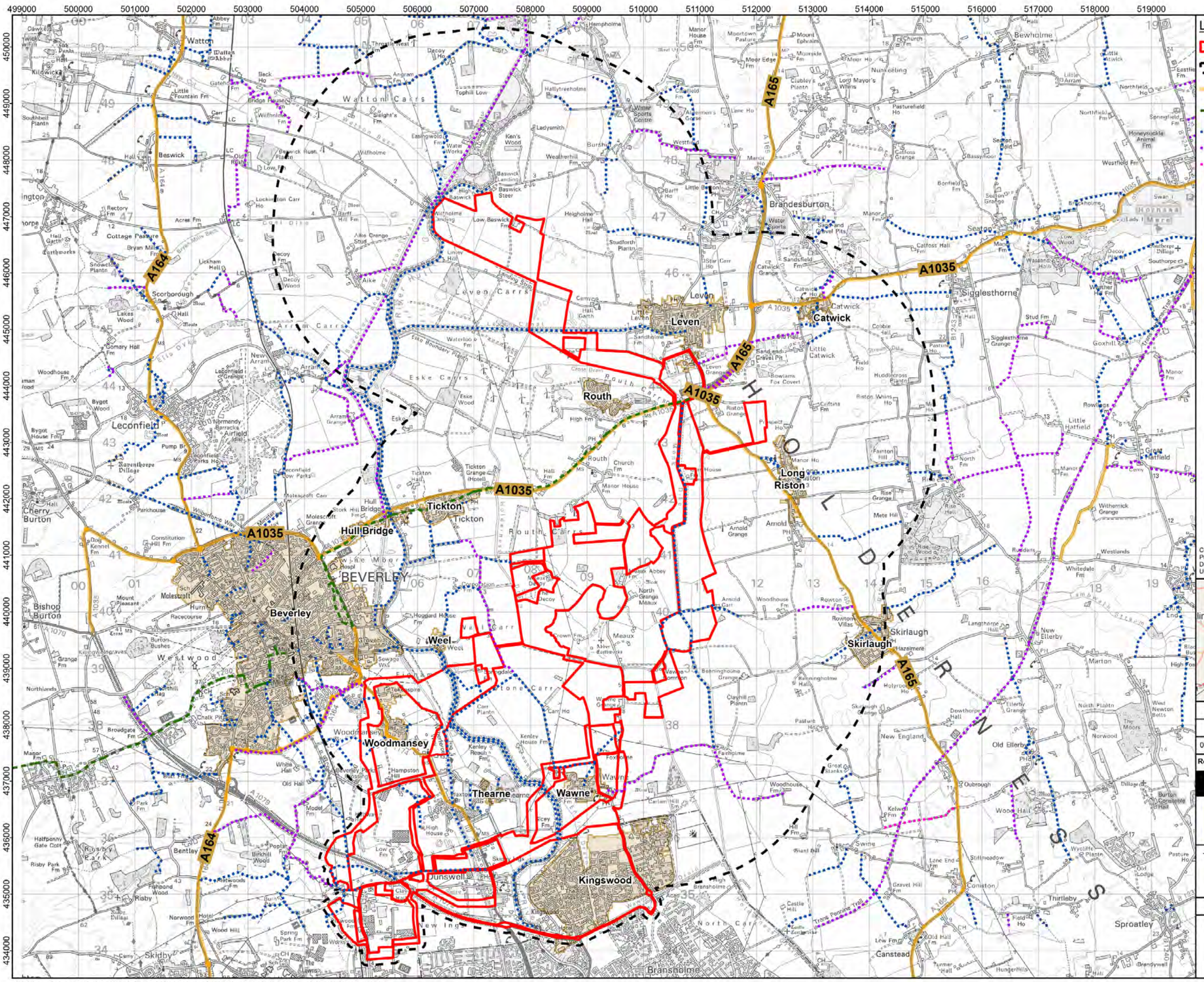
TITLE: Figure 4
LVIA Scoping ZTV Substation

ID:Figure 4 ZTV Substation

0 0.5 1
Kilometres
Scale: 1:40,000 @ A3

REV 00

Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 500s - 0589 - Peartree Solar Farm DCO\05 Working Files\03 GIS\P663880\P663880.aprx\Figure 4 ZTV Substation


Legend:
Site Boundary
Proposed LVIA Study Area
Key Routes
NCN Route 164
Footpath
Bridleway
Byway Open to All Traffic
Coordinate System: British National Grid
Projection: Transverse Mercator
Datum: OSGB 1936
Units: Meter
Driffield
Hornsea
Beverley
South Cave
Hull
Hedon
Withernsea
Rev | Date | Description | Drn | Chk | App
00 | 01/11/2023 | First Draft | MP | ZF
Peartree Hill Solar Farm
RSK
JBM SOLAR
TITLE: Figure 5
Potential Visual Receptors
ID:Figure 5 Potential Visual Receptors
0 1 2
Kilometres
Scale: 1:62,000 @ A3
REV 00
Path: C:\Users\mo.pamplin.RSKHELSBY\RSK Group\SH Projects 500s - 0589 - Peartree Solar Farm DCO\05 Working Files\03 GIS\P663880\P663880.aprx\Figure 5 Potential Visual Receptors
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