



Tillbridge Solar

PEI Report Non-Technical Summary
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1. Introduction

1.1 Overview

- 1.1.1 This document has been prepared on behalf of Tillbridge Solar Ltd¹ (hereafter referred to as ‘the Applicant’) and is a Non-Technical Summary (NTS) of the Preliminary Environmental Information (PEI) Report that has been prepared for the proposed Tillbridge Solar scheme (hereafter referred to as ‘the Scheme’), which is located approximately 5km to the east of Gainsborough and 13km to the north of Lincoln.
- 1.1.2 The Scheme will involve the construction, operation (including maintenance) and eventual decommissioning of ground mounted solar panels, along with associated infrastructure such as battery energy storage systems (BESS), across approximately 1,400 hectares (ha) of land, as well as an approximately 16km long underground cable to export solar electricity to the national electricity transmission network.
- 1.1.3 The Scheme is a Nationally Significant Infrastructure Project (NSIP) under the Planning Act 2008 (Ref. 1), as it will have the capacity to generate, store and export more than 50 megawatts (MW) of electricity. Under the Planning Act, a type of planning consent called a Development Consent Order (DCO) is required to build an NSIP.
- 1.1.4 The Applicant will carry out additional design and environmental assessment work after statutory consultation (of which the PEI Report is a key part), with the intention of submitting an application for a DCO in Q4 2023. Following an examination by the Planning Inspectorate, this application will then be decided by the Secretary of State for Energy Security and Net Zero.

1.2 What is an Environmental Impact Assessment?

- 1.2.1 Environmental Impact Assessment (EIA) is a process to ensure that planning decisions are made with full knowledge of the likely significant environmental effects of a proposed development. The outcome of the EIA process is reported within an Environmental Statement (ES) submitted with a DCO application. The ES is an update to the PEI Report, based on further environmental information and assessment.
- 1.2.2 The objective of the EIA is to identify any likely significant effects which may arise from the proposed development and to identify measures to prevent, reduce or offset any adverse effects and to enhance any beneficial effects. During the EIA process for the Scheme to date, opportunities and management measures have been identified and incorporated within the development proposals to prevent or reduce any adverse effects, and to enable sustainable design and construction principles to be embedded within the Scheme. Such opportunities and measures will continue to be identified and incorporated into the Scheme throughout the EIA process.

¹ The Applicant is a joint venture between Tribus Clean Energy and Canadian Solar, who are both experienced developers of renewable energy projects.

1.3 Purpose of the PEI Report

- 1.3.1 The purpose of the PEI Report is to accompany formal consultation, as required by the Planning Act 2008 (Ref. 1), which is the legislation that details how the DCO process operates.
- 1.3.2 The environmental assessment information contained within the PEI Report is 'preliminary' and does not represent a final project design or include final EIA conclusions. The Applicant is seeking consultation responses to the information presented in order to continue to refine the Scheme design. The Applicant will continue to obtain information that will inform the final assessment of environmental impacts, which will then be contained within the ES that will accompany the DCO application for the Scheme.
- 1.3.3 Given the PEI Report contains 'preliminary' information on the environmental assessments, the assessments are inherently conservative. On-going work on the design of the Scheme will provide additional information and certainty, which will allow the environmental assessments presented in the ES to be further refined. With further design certainty, it is anticipated that conclusions regarding the significance of some of the environmental effects assessed in the PEI Report could be revised downwards in the ES (i.e. adverse effects may be found to be lesser than anticipated in the PEI Report).
- 1.3.4 The PEI Report has been prepared to meet the requirements of the Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 ('the EIA Regulations') (Ref. 2).

2. Scheme Location

2.1 The Scheme Boundary

2.1.1 The land required to construct and operate the Scheme (hereafter referred to as ‘the Scheme Boundary’) is located approximately 5km to the east of Gainsborough and approximately 13km to the north of Lincoln. The area within and surrounding the Scheme Boundary is a mostly rural, including open agricultural fields with sparse areas of woodland and villages.

2.1.2 The Scheme is comprised of two distinct elements, which are:

- ‘the Principal Site’, which is an approximately 1,400ha area of land where the solar panels will be installed, along with associated infrastructure for the storage of generated electricity, such as sub-stations and BESS; and
- ‘the Cable Route Corridor’, which will be an approximately 16km long underground cable that is required to connect the Principal Site to a National Grid sub-station at Cottam Power Station, therefore allowing electricity generated by the Scheme to be exported to the national grid.

The Principal Site

2.1.3 As shown on Figure 1, the Principal Site is located to the south of Harpswell Lane (A631), to the west of Middle Street (B1398) and largely to the north of Kexby Road and to the east of Springthorpe. The Principal Site is located entirely within the administrative area of West Lindsey District Council.

2.1.4 Harpswell Lane (A631) and Middle Street (B1398) form the extent of the northern and eastern boundaries of the Principal Site. A thin strip of land on the western side of Middle Street is included within the Scheme Boundary to allow for landscape screening. The Principal Site extends to the south of Kexby Road with the inclusion of field parcels.

2.1.5 The Principal Site comprises numerous field parcels used for arable farming. The fields are large with limited hedgerows and trees. Where there are hedgerows, these generally form the boundaries of fields as they adjoin roads. There are also some small, scattered areas of woodland located within the Principal Site, as well as with some rural dwellings and agricultural buildings dispersed across the area.

2.1.6 Mature hedgerows and trees line the northern boundary of the Principal Site along the A631. To the west, the surrounding area is predominantly open fields with some bordered by hedgerows. To the east, the landscape is defined by a sharp slope referred to as the Lincoln Cliff. This area is relatively elevated compared to the general character of the area, which is otherwise a flat rural landscape.

The Cable Route Corridor

2.1.7 The Cable Route Corridor will connect the Principal Site to an existing National Grid sub-station located at the decommissioned Cottam Power Station in Nottinghamshire.

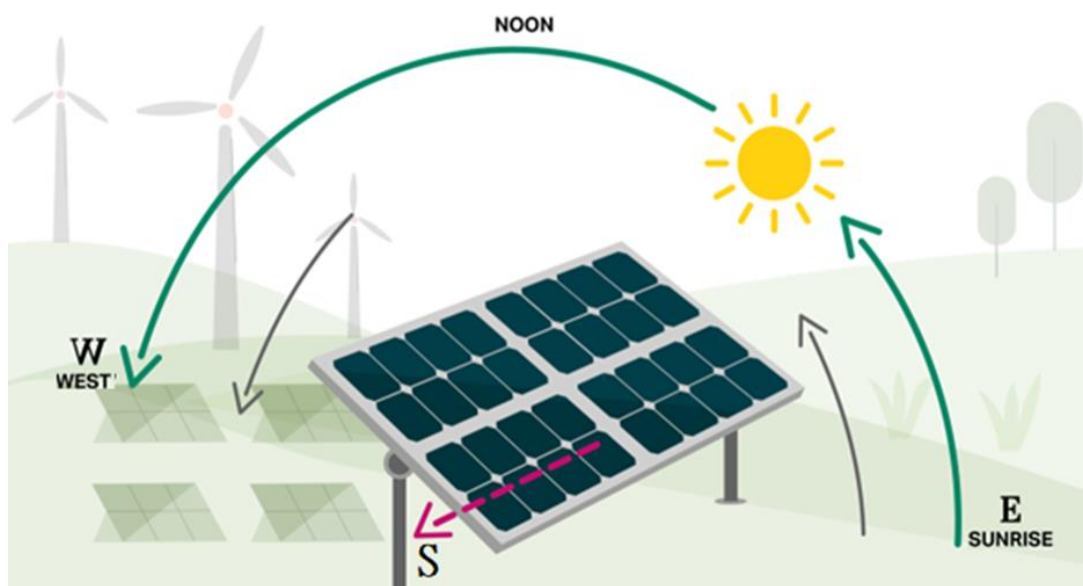
- 2.1.8 At this stage, the final route of the Cable Route Corridor has not been confirmed and it is subject to on-going design work. The extent of the Cable Route Corridor as shown in Figure 1 is likely to be refined once further design work has been completed and construction requirements are understood. For the purposes of the PEI Report, it has been assumed that works through the extents shown in Figure 1 will be required.
- 2.1.9 Heading south from the Principal Site, the Cable Route Corridor crosses Common Lane, Cow Lane, Kexby Road and Fillingham Lane before turning to the west crossing South Lane, Stone Pit Lane and Stow Road (B1241) (located to the south of Willingham by Stow). The Cable Route Corridor continues in a westerly direction before crossing the East Midlands Railway line that provides services between Doncaster and Lincoln, and runs in a broad north-south direction to the west of Willingham by Stow and to the east of Gate Burton. The Cable Route Corridor then continues westwards crossing the A1500 (Stow Park Road), followed by the A156 (Gainsborough Road) before crossing the River Trent to connect with the Cottam sub-station.

3. Scheme Description

3.1 Principal Site

- 3.1.1 The Principal Site will primarily comprise solar panels, which will convert solar energy into electricity for storage onsite and then export to the National Grid at the Cottam sub-station via the Cable Route Corridor.
- 3.1.2 The solar panels will be mounted on a single axis tracker, oriented north to south. This means that the solar panels will be able to move from east to west during the course of the day to follow the sun as it moves through the sky, as illustrated on Plate 3-1. These 'tracker panels' are more efficient than 'fixed panels' that are unable to move during the course of the day. The use of tracker panels allows approximately 6-15% more sunlight contact with the solar panels throughout the daytime.

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



- 3.1.3 The solar panels, as well as associated infrastructure for energy storage, will be located across the Principal Site. However, land will be retained around the Principal Site for landscape planting, biodiversity enhancements and setbacks from areas of existing woodland. Solar panels will therefore not be installed up to the edge of the Scheme Boundary or covering the full extent of the Principal Site.
- 3.1.4 The exact locations of solar panels have not yet been determined and will only be decided upon when the detailed design of the Scheme is completed, which will occur after determination of the DCO application. Therefore, for the purposes of the PEI Report and environmental assessments, where flexibility needs to be retained until the detailed design work is complete, conservative assumptions have been used that provide for a reasonable 'worst-case' scenario. The final design of the Scheme will be legally required to have environmental impacts no worse than those presented in the ES that will be submitted with the DCO application.

3.2 Scheme Components

3.2.1 The Scheme is anticipated to comprise the following components, primarily within the Principal Site.

- **Solar panels:** these convert sunlight into electrical current. The maximum height of the highest part of the solar panel will be a maximum of 3.5m above ground level. The solar panels will be mounted on structures in rows (also called ‘strings’). Each string will sit between approximately 1.87m and 2.62m apart.
- Associated infrastructure for the conversion of electricity ready for export will include **inverters**², **transformers**³ and **switchgear**⁴. This infrastructure will be housed either separately or together in a container unit or similar. The maximum height of these structures would be 3m to 3.5m.
- One or more **BESS** (expected to be formed of lithium-ion batteries storing electrical energy) will be required within the Principal Site. The BESS will be located in individual containers or housed within a larger building or buildings. The footprint of each battery energy storage container would be a maximum of 12.2m in length, 2.5m in width and 4m height.
- Up to **two electrical compounds** comprising a substation and switch room. Each substation compound would have a maximum footprint of around 120m in length, 106m in width and 10m in height. The switch room will be up to 30m in length, 10m in width and 6m in height.
- A **Solar Farm Control Centre**, which will allow around 10 to 12 staff to operate and maintain the plant during day shifts only. The Solar Farm Control Centre will be a maximum of 20m in length, 15m in width and 6m in height.
- An **equipment storage building** comprising storage containers or an open storage area. The storage containers will be a maximum of 12m in length, 2.5m in width and 3m in height. Alternatively, an open storage area may be used for spare parts that would be covered by an open-sided 3.2m high canopy.
- Onsite **buried high and low voltage cabling** to connect the solar panels, BESS and associated infrastructure. These will be buried to a maximum depth of 1.7m.
- Other features such as internal access roads, drainage ponds, fencing, lighting and CCTV within operational areas.
- Landscaping including habitat creation areas.
- Temporary parking.
- Temporary construction compounds and laydown areas.

² Inverters convert direct current (DC) electricity collected by the solar modules into alternating current (AC).

³ Transformers control the voltage of the electricity generated across the Principal Site.

⁴ Switchgear comprises a combination of electrical disconnect switches, fuses or circuit breakers used to control, protect and isolate electrical equipment.

3.3 Cable Route Corridor

- 3.3.1 The electricity generated by the Scheme is to be exported via 400 kilovolt (kV) buried cables within the Cable Route Corridor, from the onsite substations to Cottam National Grid Substation. The Cable Route Corridor will be directed across open countryside and requires crossings of the railway, watercourses, various utilities, and roads.
- 3.3.2 The total length of the cable run for Cable Route Corridor will be approximately 16km. In general, aside from crossings of watercourses and other obstacles, it is anticipated that the Cable Route Corridor will be installed approximately 1-2m below ground level.

3.4 Construction

Construction Programme

- 3.4.1 Subject to the DCO for the Scheme being granted, the earliest construction would start is 2025, with operation of the Scheme targeted to commence in 2027.
- 3.4.2 The PEI Report has assumed a construction programme of approximately 24 months, which would be achievable if the Scheme is built in one continuous phase. This is considered the 'worst case scenario' in terms of environmental impacts because it is the most rapid build out period, which leads to more intense impacts (such as the number of construction vehicle road trips per day) relative to a slower build out.

Construction Activities

- 3.4.3 The final construction programme will be dependent on the detailed Scheme design and potential ecological constraints on the timing of construction activities.
- 3.4.4 Construction works are envisaged to include the following activities:
- Site preparation;
 - Import of construction materials, plant and equipment to site;
 - Establishment of the perimeter fence;
 - Establishment of the site compounds;
 - Construction of the internal access roads;
 - Piling to install the module mounting structures for solar panels;
 - Mounting solar panels onto the mounting structures by hand;
 - Trenching and installation of electric cabling between solar panels;
 - Excavation for foundations for structures needed on site;
 - Installation of structures needed on site; and
 - Installation of control systems, monitoring and communication.
- 3.4.5 Commissioning of the Scheme will include testing and commissioning of the process equipment. Commissioning of the solar panel infrastructure will

involve mechanical and visual inspection, electrical and equipment testing, and commencement of electricity supply into the grid.

- 3.4.6 The construction of the Cable Route Corridor will be undertaken in phases. In many locations an open cut method will be used for construction, whereby material is excavated along the Cable Route Corridor, the cable is laid, and the ground backfilled and restored. For certain crossings (e.g. railways, roads or rivers), cables may be installed by drilling them underground.

Site Access

- 3.4.7 For the Principal Site, it is anticipated that construction access will include four access/egress points. Three would be located along the A631 and one would be located on the B1398 Middle Street. For the Cable Route Corridor, it is anticipated that construction access will include additional accesses along the route, which will be confirmed when the DCO application is submitted. The locations of all proposed accesses are shown in Figure 2.

Construction Compounds

- 3.4.8 All construction compounds will be located within the Scheme Boundary. The compounds contain offices, mobile welfare units, canteens, storage and waste skips, parking areas and space for storage, download and turning area. These construction compounds will also be used as compounds during the construction of the Cable Route Corridor.

Construction Staff

- 3.4.9 At the peak of construction (based on the most rapid possible build out of 24 months as a worst-case scenario), up to 1,250 staff per day will be required to work across the Scheme. This number will be less at other times of the construction phase. Working days will be one 12-hour shift, with working hours onsite from 7am until 7pm Monday to Saturday. All deliveries (including those delivered by heavy goods vehicles (HGVs)) would be within core working hours. All construction staff travel to and from the Scheme Boundary would be the hour before and after core working hours (i.e. outside of rush hour). A Construction Traffic Management Plan (CTMP) will be prepared to manage the impacts of construction traffic associated with the Scheme.

Construction Controls

- 3.4.10 A Construction Environmental Management Plan (CEMP) will be secured by Requirement in the DCO (i.e., a legal commitment), which will include measures to minimise environmental effects during construction works. Draft framework plans for the CEMP and CTMP, which reflect the outcomes of environmental assessments to date, are included in **PEI Report Volume II Appendix 3-1** and **PEI Report Volume II Appendix 15-2**. Where appropriate, measures to be included in these management plans will be agreed with relevant stakeholders prior to commencement of construction.

Public Rights of Way

- 3.4.11 Appropriate measures to mitigate temporary impacts on users of Public Rights of Way (PRoW) during the construction and decommissioning phases will be proposed. If necessary, temporary closures and diversions will be supported

by appropriate and clearly signed alternative routes and where possible will be planned and programmed to minimise disruption to users. The requirement for any temporary closures and diversions will be confirmed within the ES and managed through the Framework CTMP as part of the DCO application.

Reinstatement

- 3.4.12 Following construction, a programme of site reinstatement and habitat creation will commence within the Scheme Boundary. It is anticipated that the areas under the solar panels and areas outside of the developable areas will be planted with native grassland mix, and hedgerows and woodland will be planted in strategic locations to provide visual screening, as shown on Figure 3.

3.5 Operation

- 3.5.1 Once the Scheme has been constructed and is operational, activity will be minimal and will be restricted principally to vegetation management; equipment maintenance and servicing; replacement of any components that fail; and monitoring to ensure continued effective operation of both the Scheme and the associated environmental mitigation measures.
- 3.5.2 It is anticipated that there will be up to 10-12 permanent staff located on-site once the Scheme is operational. It is expected that there will be approximately 10-20 HGV or transit van deliveries to the Principal Site per year.

3.6 Decommissioning

- 3.6.1 The design and operational life of the Scheme is expected to be around 40-60 years, with decommissioning expected to commence thereafter, albeit the operational life may extend beyond this timeframe.
- 3.6.2 Decommissioning is expected to take between 12 and 24 months and will be undertaken in phases. All solar panels, mounting structures, structures, foundations, cabling, inverters and transformers will be removed and recycled or disposed of in accordance with good practice and market conditions at that time. It is anticipated that sub-stations and the control building would be remain, as would any areas of landscaping planted as part of the Scheme.

4. Design Evolution and Alternatives

- 4.1.1 **PEI Report Volume I Chapter 4: Design Evolution and Alternatives** presents an overview of the consideration of alternatives including the justification for selecting the location of the Scheme, how the design has evolved since EIA Scoping, and a discussion of the reasonable alternatives.
- 4.1.2 The location of the Scheme was identified through a site search exercise undertaken by the Applicant. The reasons for selecting the site will be presented in the ES, along with a description of and justification for the evolution of the Scheme Boundary.
- 4.1.3 A range of technical, environmental and economic factors are considered when investigating and assessing any potential site for solar schemes that require a DCO. Key factors for consideration include (in no particular order):
- Solar energy levels;
 - Proximity to an available grid connection;
 - Topography;
 - Field size / shading;
 - Access to the site for construction;
 - Engagement with local landowners; and
 - Environmental and social constraints as described in this document, including proximity to local population, archaeological interest, agricultural land classification, landscape designations, nature conservation designations, and flood risk, for example.
- 4.1.4 Following consideration of the above factors, the area in which the Scheme has been located was identified as having good potential for a large-scale solar farm.
- 4.1.5 The preparation of the Preliminary Environmental Information Report has led to a variety of key changes to the layout and technology. These are detailed further in **PEI Report Volume I Chapter 4: Alternatives and Design Evolution**, but include:
- Reduction in land and refinement of the layout plan following desktop analysis and site surveys.
 - Provision of buffers and offsets from existing landscape features such as ponds, hedgerows, woodland and Public Rights of Way.
 - New grassland and wildflower mixes under the panels to enhance the range of fauna, enhancing biodiversity and providing resource for pollinators.
 - Screening and planting design to reduce visual impact by providing environmental enhancement areas, off-sets and buffer zones.
 - Siting of infrastructure to avoid below ground archaeological features wherever possible. Screening and planting will be designed to minimise impact on the setting of heritage assets.

- The Scheme Boundary has been pulled back from Springthorpe, as well as from the Harpswell Hall scheduled monument.
- An alternative Cable Route Corridor that directed the route to the north of Willingham-by-Stow was removed as an option with the focus of more detailed design work on land to the south of Willingham-by-Stow. This will maximise the opportunity for the sharing of the corridor with other developers.
- Use of solar panels that are mounted on a single axis tracker and 'track' east to west during the daytime to maximise the amount of sunlight that hits the solar panels and energy generated. These also have a lower visual impact compared to fixed solar panels.

5. EIA Methodology

5.1 Topics Assessed

- 5.1.1 The environmental effects of the Scheme have been assessed during construction, operation and decommissioning. The effects are described in terms of changes to the existing situation (the baseline). EIA assesses environmental effects on resources (such as archaeology) and receptors (such as human beings or animals such as great crested newt). The significance of the environmental effects were assessed by judging the sensitivity (that is, the importance) of a resource or receptor against the magnitude (that is, the scale or extent) of the predicted impact. The duration and geographic scale of the effects were also taken into account.
- 5.1.2 The content or 'scope' of the EIA was agreed through the production of an EIA Scoping Report, which was submitted to the Planning Inspectorate⁵. Following the preparation of an 'EIA Scoping Opinion' by the Planning Inspectorate, the following environmental topics have been assessed in the Preliminary Environmental Information Report:
- Air Quality;
 - Climate Change;
 - Cultural Heritage;
 - Ecology;
 - Flood Risk, Drainage and Surface Water;
 - Human Health;
 - Landscape and Visual Amenity;
 - Noise and Vibration;
 - Socio-Economics and Land Use;
 - Transport and Access; and
 - Other Environmental Topics, including glint and glare; ground conditions; major accidents and disasters; telecommunications; and waste.
- 5.1.3 A development of this nature is likely to have some effects on the environment, both beneficial and adverse. What is important is that 'significant' effects are identified, with significant adverse effects reduced through the design process, or through other mitigation measures. The purpose of identifying significant environmental effects is to ensure that decision makers are able to make an informed judgement on the environmental impacts of a proposal before granting planning consent. Each of the technical chapters within **PEI Report Volume I** provides further description of the method that has been used to determine whether an effect is significant or not.
- 5.1.4 Where significant adverse environmental effects are likely to occur, additional measures are proposed to reduce effects where practicable. Any effects that

⁵ The Planning Inspectorate (also sometimes referred to as 'PINS') are the government agency responsible for examining DCO applications and making recommendations to the relevant Secretary of State about whether DCO for a Scheme should be granted.

remain, once these measures are taken into account, are reported as 'residual effects'.

5.1.5 The beneficial effects are also reported to ensure the benefits arising from the Scheme are realised and the balance of issues is understood.

5.1.6 The remainder of this Non-Technical Summary sets out the findings of the Preliminary Environmental Information Report, on a topic by topic basis.

6. Findings of the Preliminary Environmental Information Report

6.1 Introduction

- 6.1.1 An assessment of the environmental effects of the Scheme during its construction, operation (including maintenance and repairs), and eventual decommissioning has been completed for each of the topics identified in Section 5.1.2 above.
- 6.1.2 The likely significant environmental effects of the Scheme are fully described within the **PEI Report Volume I**. This section provides a brief summary of the overall findings of the report. A summary of all the potentially significant environmental effects of the Scheme is provided in **PEI Report Volume I Chapter 18: Summary of Significant Effects**.

6.2 Air Quality

Introduction

- 6.2.1 **PEI Report Volume I Chapter 6: Air Quality** presents the findings of an assessment of the likely significant effects on local air quality as a result of the Scheme. The assessment considers the potential for the Scheme to generate dust during the construction phase, as well as the potential impacts of emissions from construction traffic and plant on local air quality.

Baseline

- 6.2.2 There are no Air Quality Management Areas⁶ in this area. West Lindsey District Council or Bassetlaw District Council do not have any air quality monitoring stations close to the Scheme Boundary. Their nearest monitoring stations are 5km west and 4km south of the Scheme Boundary respectively.
- 6.2.3 A three month air quality monitoring survey was undertaken at nine roadside sites in the vicinity of the Scheme in 2022. It shows that existing air quality is generally good and complies with the national air quality objectives.

Assessment of Effects

Construction Effects

- 6.2.1 Due to the nature of the works which involve trenching and movement of vehicles, the Scheme has a high risk of generating airborne dust (although noting that works in any one location will be relatively limited). With the implementation of standard mitigation measures included in the Construction Environment Management Plan, it is considered that this risk can be adequately managed, leading to a low risk to human health. Impacts from dust are therefore anticipated to be **not significant**.
- 6.2.2 An assessment of the potential impacts of emissions from construction traffic and plant on local air quality has not been included in the Preliminary

⁶ National air quality targets have been put in place to protect people's health and the environment. If a local authority finds any places where those targets are not likely to be achieved, it must designate that area as an Air Quality Management Area. This area could be just one or two streets, or it could be much larger.

Environmental Information Report as the construction traffic and plant numbers for the Scheme still need to be confirmed. This assessment will be included in the ES if those numbers exceed the thresholds given in guidance. At this stage, given the relatively good existing air quality around the Scheme, it is not expected that construction traffic and plant will lead to any exceedances of air quality targets and therefore impacts as a result of this are anticipated to be **not significant**.

Operational Effects

- 6.2.3 An assessment of air quality once the Scheme is complete and operational has not been completed. This is because the solar farm components (i.e. solar panels, cable infrastructure) will not emit greenhouse gases. In addition, the number of staff working during operation is relatively small (10-12 people) and HGV and transit van deliveries to site will be between 10-20 per year. This would not lead to significant effects on air quality, therefore it was agreed with the Planning Inspectorate during the EIA scoping process that no assessment was required.

Decommissioning Effects

- 6.2.4 It is assumed that the air quality effects during decommissioning will be similar to, if not less than, the construction phase. Decommissioning is expected to be shorter in duration, less intensive and with fewer road trips. Therefore, the standard mitigation measures included in the Construction Environment Management Plan to mitigate impacts from dust will be appropriate for the decommissioning phase too. Mitigation measures for the decommissioning phase would be included in the DEMP. Any impacts are therefore anticipated to be **not significant**.

Mitigation and Monitoring

- 6.2.5 Standard mitigation measures to manage the risk of dust being generated and causing nuisance will be included in a Construction Environment Management Plan. This will include avoiding stockpiling soil and materials near to the Scheme Boundary, using water to damp down soil if earthworks are undertaken in dry weather, and covering any dusty materials being transported on or off-site.
- 6.2.6 Mitigation or monitoring may be required for construction traffic emissions. This will be determined at the ES stage but is currently not expected to be required.

6.3 Climate Change

Introduction

- 6.3.1 **PEI Report Volume I Chapter 7: Climate Change** presents the findings of an assessment that considers whether greenhouse gas (GHG)⁷ emissions from the construction, operation, and decommissioning of the Scheme will be significant, as well as how resilient the Scheme will be to projected future climate change impacts.

⁷ Greenhouse gases are gases that trap heat in the Earth's atmosphere. Examples are carbon dioxide (CO₂), nitrogen dioxide (NO₂) and methane (CH₄). An increase in the amount of greenhouse gases in the atmosphere has led to climate change.

Baseline

- 6.3.2 This assessment has been completed in the context of the UK Government setting a legal target to achieve 'net zero' GHG emissions across electricity generation, industry, transport and domestic sources by 2050 (Ref. 3).

GHG Assessment

- 6.3.3 The baseline for GHG emissions is a 'business as usual' scenario where the Scheme does not go ahead. Activities related to the Scheme that would generate GHG emissions include manufacture of the solar panel components, transport of materials for construction and emissions from plant used during construction.

- 6.3.4 At this stage, quantities of materials required to construct the Scheme have not been confirmed, therefore the assessment in the Preliminary Environmental Information Report has used other solar schemes that have required a DCO as a benchmark to understand the likely scale of GHG emissions that will be associated with this Scheme. The assessment included in the ES will include quantities of materials specific to this Scheme.

Climate Change Resilience (CCR) Review

- 6.3.5 The CCR Review considers the impact of climate on the Scheme by looking at the likely changes to the climate over the operational lifespan of the Scheme (approximately 40-60 year period from when construction of the Scheme is completed). The baseline describes the current climate, whilst the project-scenario describes the likely climate during the project-phases.

Assessment of Effects

GHG Assessment

- 6.3.6 The greatest GHG emissions occur during the construction phase as a result of the manufacture of the materials and components required to build the Scheme. The manufacture of the BESS and solar panels will result in GHG emissions and it is assumed these will be manufactured abroad, resulting in GHG emissions associated with transport to the site.

- 6.3.7 Other sources of GHG emissions will include transport of materials for construction, maintenance activities during operation and emissions from plant used during decommissioning. However, the impact of the Scheme on climate during construction and decommissioning, considering that these GHG emissions are ultimately enabling renewable energy generation, is **not significant**.

- 6.3.8 Although there will be GHG emissions associated with the Scheme, this is more than offset by the renewable energy generated by the Scheme, which will help the UK to achieve net zero by 2050. The impact of the Scheme on climate once operational is therefore considered to be a **significant beneficial effect**.

CCR Review

- 6.3.9 Potential climate changes that could affect the resilience of the Scheme include increased frequency/severity of extreme weather and increased sea level rise affecting the operation of the Scheme.

- 6.3.10 The CCR Review included in the Preliminary Environmental Information Report has not identified any potentially significant climate change risks relevant to the Scheme, however, further assessments will be completed as part of the ES to confirm whether any climate adaptation measures need to be designed into the Scheme.

Mitigation and Monitoring

Greenhouse Gas Risk Assessment

- 6.3.11 Applicable measures for the reduction of energy and carbon emissions during the construction phase will be included within the Construction Environment Management Plan. This will include measures such as sourcing construction materials locally wherever practical to reduce transportation pollution, using low-carbon materials and/or recycled materials where possible and looking at methods to reduce GHG emissions associated with construction worker travel to the site.
- 6.3.12 The nature of the Scheme itself will have a beneficial effect in terms of GHG emissions on climate change. No additional mitigation or monitoring beyond the measures described above are required during construction, operation or decommissioning of the Scheme.

Climate Change Risk Assessment

- 6.3.13 Where necessary, climate adaptation measures will be designed into the Scheme, with particular reference to the recommendations of **PEI Report Volume I: Chapter 10: Flood Risk, Drainage and Surface Water** to ensure that surface water is managed appropriately and flood risk is not increased.

6.4 Cultural Heritage

Introduction

- 6.4.1 **PEI Report Volume I Chapter 8: Cultural Heritage** presents the findings of an assessment of the likely significant effects of the Scheme on buried archaeology and built heritage assets within the site and surrounding area. The assessment considers the impacts during construction, operation and decommissioning of the Scheme.

Baseline

- 6.4.2 The baseline for cultural heritage was identified through completion of a desk-based assessment, which included a walkover survey to view assets in the vicinity of the Scheme. The desk-based assessment was informed by data collected from various sources, including the Historic Environment Record (HER) and Historic England's National Heritage List for England (NHLE).
- 6.4.3 The buried archaeology baseline is being further supplemented by completion of geophysical surveys on the Principal Site, although the survey results have not been available in time to inform this assessment. The conclusions on potential impacts to buried archaeology are based on information available at this time, and may change depending on the results of the geophysical survey and any further archaeology fieldwork.
- 6.4.4 In terms of buried archaeology, the desk-based assessment concludes there is evidence of archaeological assets within the study area dating from

10,000BC to the modern era. There is considered a particularly high likelihood of encountering archaeology from the Iron Age, Roman, Medieval and Post Medieval eras in the Scheme Boundary.

- 6.4.5 In terms of built heritage, there are 170 listed buildings within 3km of the Scheme Boundary. There are no scheduled monuments or listed buildings within the Principal Site, with the nearest being the scheduled monument of Harpswell Hall and the grade I listed Church of St Chad, which are located in Harpswell approximately 200m to the east and north of the Principal Site. There are also no scheduled monuments or listed buildings within the Cable Route Corridor, although four grade II listed buildings are located adjacent to the boundary.

Assessment of Effects

Construction Effects

- 6.4.6 In terms of buried archaeology, assets within the Principal Site have been assessed to have low value in heritage terms and their disturbance is not anticipated to result in significant effects. Any disturbed assets would be recorded and evaluated during the construction phase. Along the Cable Route Corridor, it is anticipated that impacts on any particularly valuable archaeological assets can be avoided by routing the cable away from the asset, although there may be a requirement for temporary construction access through some historic assets such as the Winter Camp of the Viking Great Army at Torksey (MLI125067). Where temporary construction access is required, effects on buried archaeology during construction may be significant, but otherwise with careful routing of the cable it is anticipated that effects will be **not significant**.
- 6.4.7 In terms of built heritage, an assessment of how construction activity may temporarily affect the setting of built heritage assets (including scheduled monuments, listed buildings and conservation areas) will be included in the ES that accompanies the DCO application.

Operational Effects

- 6.4.8 Impacts on buried archaeology will be limited to the construction phase.
- 6.4.9 In terms of built heritage, in most cases, the Scheme will have limited effects on the setting of built heritage assets as existing vegetation and ground level differences will obscure views of the Scheme from those assets. However, solar infrastructure within the Principal Site may be visible from the scheduled monument of Harpswell Hall and the grade I listed Church of St Chad. New planting has been included in the landscape design to mitigate effects and the potential for further landscaping will be investigated further, prior to submission of the ES with the DCO application. It is currently anticipated that effects on these two assets during operation would be **significant**.

Decommissioning Effects

- 6.4.10 In terms of buried archaeology, it is not anticipated that decommissioning would have any impact beyond the already-disturbed footprint of the Scheme. It is therefore considered that all effects on buried archaeology during decommissioning would be **not significant**.
- 6.4.11 In terms of built heritage, while there is the potential for temporary setting impacts during the removal of the solar infrastructure, it is not anticipated

these will cause additional impacts over and above those reported during operation of the Scheme. Upon completion of decommissioning, the long-term adverse effects from the Scheme will have been reversed and will no longer exist. All effects on built heritage as a result of decommissioning would therefore be **not significant**.

Mitigation and Monitoring

- 6.4.12 Following a review of the geophysical survey results, a proportionate programme of trial trenching will be undertaken. This will date and characterise archaeological assets likely to be impacted by the Scheme and ground truth the geophysical survey results. Where possible, the design of the Scheme will be amended to avoid or reduce impacts to areas where sensitive buried archaeology has been identified.
- 6.4.13 An overarching Written Scheme of Investigation (WSI) detailing proposed mitigation works will be submitted to heritage stakeholders following receipt of the results of the trial trenching. Once agreed, this document would establish the objectives for the historic environment works. The WSI will also set out the mechanisms for the appointed archaeological contractor to design the investigation, undertake evaluation, analysis, reporting and deposit the archive.

6.5 Ecology and Nature Conservation

Introduction

- 6.5.1 **PEI Report Volume I Chapter 9: Ecology and Nature Conservation** presents the findings of an assessment of the likely significant effects of the Scheme on the ecology of the site and surrounding area. The assessment considers effects on designated sites, habitats and protected species. The assessment considers the impacts during construction, operation and decommissioning of the Scheme.

Baseline

- 6.5.2 The ecological baseline of the site was identified through the following desk-based studies and field surveys:
- Previous observations of protected species obtained from the local biodiversity records centre;
 - Phase 1 habitat surveys of the Scheme Boundary that commenced in spring 2022 and will continue into 2023; and
 - Protected species surveys that commenced in spring 2022 and will continue into 2023.
- 6.5.3 Based on the results of the above, the following ecological features are considered relevant to the Scheme:
- Ashton's Meadow Site of Special Scientific Interest (SSSI) (located 1.5km from the Scheme Boundary);
 - 14 Local Wildlife Sites within 2km of the Scheme Boundary;

- Broad-leaved woodland habitats located in and around the Scheme Boundary;
 - Semi-improved natural grassland habitats located in and around the Scheme Boundary;
 - Watercourses located within the Scheme Boundary, including the River Trent and other smaller watercourses such as ditches;
 - Ponds located within the Scheme Boundary;
 - Aquatic macroinvertebrates and macrophytes;
 - Fish, such as European Eel and Spined Loach;
 - Hedgerows that may be of value to birds, bats and other fauna;
 - Birds;
 - Badger;
 - Other mammals, such as Brown Hare and Hedgehog;
- 6.5.4 Ecology surveys will be on-going through 2023 and this may identify further ecological features that will be assessed as part of the ES submitted with the DCO application.
- 6.5.5 There are no internationally designated ecological sites such as Special Areas of Conservation (SACs) or Special Protection Areas (SPAs) within 10km of the Scheme. The closest are Hatfield Moor SAC (located 20.4km from the Principal Site) and Birklands and Bilhaugh SAC (located 19km from the Cable Route Corridor). There are no SACs that are designated due to bat populations within 30km of the Scheme. It is therefore considered that the Scheme has no potential to impact any internationally designated ecological sites.

Assessment of Effects

Construction Effects

- 6.5.6 The closest SSSI to the Scheme is the Ashton's Meadow SSSI, which is designated primarily due to grassland habitats, however, it is approximately 1.5km from the Scheme Boundary. Impacts from the Scheme are localised, and therefore, the Scheme would have no direct impact on the SSSI, nor any indirect impact (such as changes to the water table). Effects on SSSIs are therefore **not significant**.
- 6.5.7 The Cable Route Corridor passes through Upton Grange Road Verges LWS, Willingham to Fillingham Road Verges LWS and Cow Pasture Lane Drain LWS. Further surveys of these sites are planned in 2023. The route of the Cable Route Corridor will be developed and if a route through the LWS is required, then it is currently anticipated the cable would be installed by drilling the cable underneath these sites, which would avoid the need for any vegetation clearance in the LWSs. Construction works close to the LWSs would be undertaken in accordance with mitigation measures documented within a Construction Environment Management Plan to avoid causing any dust or water pollution. All other LWSs are outside of the Scheme Boundary and there is considered no potential for the Scheme to impact these LWSs when mitigation measures documented within a Construction Environment

Management Plan are implemented. Effects on LWSs are therefore considered to be **not significant**.

- 6.5.8 The layout of the Principal Site has been designed so that impacts on habitats such as woodland, running water and ponds are avoided. Construction will not lead to the clearance or fragmentation of woodland habitats. Mitigation measures documented in a Construction Environment Management Plan would include ensuring that temporary fencing is used to stop construction works drifting too close to woodland. Effects on woodland are therefore considered to be **not significant**.
- 6.5.9 Construction activities will result in loss of arable farmland used by breeding skylarks. The Scheme has therefore incorporated areas within the Scheme Boundary where solar panels will not be installed and instead will be planted with biodiverse grassland, which will be specifically managed for ground-nesting birds. At this stage, although the extent of this mitigation is not confirmed, it is anticipated that the mitigation developed will ensure effects on skylark are not significant, however, until this is confirmed and on a precautionary basis, effects on skylark are currently assessed as **significant**.
- 6.5.10 For the Cable Route Corridor, the River Trent will be crossed by drilling the cable underneath the riverbed, which would avoid any impacts to the river. The launch and exit pits for this drilling will be located either side of the River Trent and would be situated so that they avoid any sensitive habitats. Effects on ecological habitat within and next to the River Trent are therefore anticipated to be **not significant**.
- 6.5.11 Where possible, the Cable Route Corridor will also cross other smaller watercourses and ditches by drilling the cable underneath them, particularly those that may support fish, eels and other aquatic species. Further ecology surveys are due to be completed through 2023 and on-going design work to refine the Cable Route Corridor will be required. The ES that will accompany the DCO application will include the refined Cable Route Corridor and the anticipated method for crossing each watercourse. Effects on smaller watercourses and ditches are currently anticipated to be **not significant**.
- 6.5.12 The Cable Route Corridor is anticipated to result in the removal of sections of hedgerow when it passes from one field to the next. The extent of any hedgerow removal is currently unknown, as the Cable Route Corridor needs to be refined and where possible existing gaps or gates in hedgerows will be used. Where hedgerow removal is required, any gaps would be replanted after works are completed. As the sections of replanted hedgerow may take time to develop, there is likely to be a short term adverse effect in some areas, however, new planting would include species rich variants and therefore the longer term effect would be beneficial. Until the extent of hedgerow removal is confirmed, it is conservatively assumed that the effects will be **significant**.
- 6.5.13 Effects to other protected species such as birds, badgers and reptiles will be controlled by seeking to allow suitable distances between construction works and areas where these species may be present. Precautionary methods of working will be specified within the Construction Environment Management Plan to avoid adverse impacts on any protected species identified on site. While protected species surveys will be on-going through 2023, it is currently anticipated that any effects will be **not significant**.

Operational Effects

- 6.5.14 As part of the landscape design for the Scheme, new habitats will be provided to increase biodiversity compared to existing. This will include converting areas of agricultural land around and beneath the solar panels into grassland, strengthening hedgerows by planting up any gaps, planting new areas of trees and enhancing habitats next to watercourses. These measures will benefit wildlife by increasing areas of habitat provision and improving connectivity between habitats. This will be of value to a wide range of animals, particularly farmland birds such as Skylark and Yellowhammer.
- 6.5.15 The ES that will be submitted with the DCO application will include a Biodiversity Net Gain (BNG) Assessment, which will confirm how much the Scheme will increase biodiversity. This will be expressed as a percentage compared to existing. It is expected that the Scheme will comfortably deliver more than 10% biodiversity net gain, which is the minimum amount expected in local planning policy and which is soon to become mandatory national planning policy as part of the Environment Act (Ref. 4).
- 6.5.16 No adverse impacts to ecology as result of the Scheme once it is operational are anticipated. There is no requirement for the Scheme to be continuously lit. The drainage system for the Scheme will be designed to manage, and if necessary, treat, surface water runoff so that adverse effects on aquatic ecology are avoided. Maintenance activities will be carried out in accordance with mitigation measures documented within an Operational Environmental Management Plan (OEMP), a draft of which will be included in the ES that will be submitted with the DCO application. Effects on ecology during operation of the Scheme are therefore **not significant**.

Decommissioning Effects

- 6.5.17 Activities associated with the eventual decommissioning of the Scheme will be carried out in accordance with mitigation measures documented within a Decommissioning Environmental Management Plan (DEMP).
- 6.5.18 It is anticipated the majority of impacts to ecology, and measures to mitigate these impacts, will be similar to those during construction. It is also anticipated that any areas of landscaping planted as part of the Scheme will be retained. The effect of decommissioning is therefore anticipated to be **not significant**.

Mitigation and Monitoring

- 6.5.19 Although further work is required to refine the Cable Route Corridor, at this stage it is anticipated that significant adverse effects on ecology can be avoided either by routeing the cable away from sensitive ecological areas or specifying certain construction methods to reduce impacts.
- 6.5.20 Ecology surveys across the Scheme Boundary will be on-going during 2023. Should these surveys identify protected species are present, then the Scheme will be designed to mitigate impacts wherever possible.
- 6.5.21 A monitoring programme will be detailed in the DCO application to ensure that new habitats delivered as part of the Scheme establish successfully.

6.6 Flood Risk, Drainage and Surface Water

Introduction

- 6.6.1 **PEI Report Volume I Chapter 10: Flood Risk, Drainage and Surface Water** presents the findings of an assessment of the likely significant effects of the Scheme on the water environment, which includes impacts on flood risk, surface water features (such as rivers, streams and ditches) and groundwater, as well as the Scheme's demand for water during operation. The assessment considers the impacts during construction, operation and decommissioning of the Scheme.

Baseline

- 6.6.2 The topography of the Principal Site is relatively flat, with existing ground levels in the region of 20-25m Above Ordnance Datum (AOD) according to online Ordnance Survey (OS) mapping. The land levels decrease to the west towards the River Trent floodplain. There are many small watercourses and drainage ditches on the Principal Site, which is currently mainly agricultural fields.
- 6.6.3 Watercourses located within the Principal Site include the River Eau, a tributary of Fillingham Beck and a tributary of the River Till. There are approximately seven watercourses located along the Cable Route Corridor, including the River Trent. Features such as ponds and small reservoirs are also located in the Scheme Boundary.

Assessment of Effects

Construction Effects

- 6.6.4 Construction works would be carried out in accordance with mitigation measures documented within a CEMP, so that impacts on local watercourses are appropriately managed and, to the extent practicable, prevented. This would include measures to prevent silty water reaching watercourses and the safe handling of fuels and chemicals on site so that any leaks or spillages do not enter soil or watercourses. Effects of construction works causing pollution to surface water features would therefore be **not significant**.
- 6.6.5 Temporary crossings of watercourses may be required to enable construction plant and equipment to reach areas within the Scheme Boundary. This may require the temporary installation of culverts along some watercourses. If this was required on watercourses considered to have high sensitivity, then the effects would be **significant**. Otherwise, the effects of this if required on watercourses considered to have low sensitivity would be **not significant**.
- 6.6.6 Where possible, cabling required either in the Principal Site or Cable Route Corridor will cross watercourses and ditches by drilling the cable underneath them using horizontal direction drilling (HDD) techniques. Appropriate risk assessments would be completed prior to any HDD crossings to ensure the risks to watercourses are addressed and mitigated. Some smaller watercourses may be crossed by 'open cut' through the channel. This is likely to only be the case for lower importance ditches and, following reinstatement after completion of works, any effects would be **not significant**.

6.6.7 Available data indicates there is a shallow water table in some parts of the Scheme Boundary. There are no structures on the Principal Site that require large/continuous foundations and would prevent groundwater from continuing to flow freely below ground through soils. The depth where cabling as part of the Cable Route Corridor will be installed is likely to be below the water table. The past and present land uses within the Scheme Boundary do not indicate there is a significant risk that soil contamination is widespread onsite, so there is considered to be a low risk that construction works would mobilise any surface contamination and affect groundwater. If groundwater is encountered in excavations, then this will be removed and disposed of in accordance with Environment Agency guidance and any environmental permits required. Effects on groundwater are therefore **not significant**.

6.6.8 The Framework CEMP will incorporate measures to prevent an increase in flood risk or pollution during the construction works, in addition to the provision of temporary settlement and drainage measures if required. Effects of the Scheme on flood risk during construction are therefore anticipated to be **not significant**.

Operational Effects

6.6.9 The drainage system for the Scheme will look to implement sustainable drainage systems (SuDS), whereby new planted areas and ponds will be created to ensure that rainfall that lands within the Scheme Boundary does not reach local watercourses quicker than existing land use. A Preliminary Drainage Strategy is available in **PEI Report Volume II Appendix 10-3** and more detailed drainage proposals will be included in the ES that will be submitted with the DCO application. Effects of the Scheme on surface water drainage are therefore anticipated to be **not significant**.

6.6.10 The BESS is being designed so that there is no impact on local watercourses from fire water in the unlikely event of a fire. For a small internal fire, the BESS will include an internal fire suppression system, likely a water sprinkler system, with the water collected in a tank so that it can be subsequently taken away for treatment and disposal. For larger fires, a system will be developed so that fire water used is contained and does not reach local watercourses. If the BESS did catch fire, it is not proposed to use any fire-fighting chemicals or to actively 'fight' the fire. It would instead be allowed to 'burn out', with fire water used to cool adjacent structures to prevent the fire from spreading. Effects on local watercourses are therefore anticipated to be **not significant**.

6.6.11 The Scheme is located within an area of water stress, as designated by the Environment Agency. At this stage, the requirements that the Scheme will have for water once operational are not confirmed. Further details will be included in the ES that will be submitted with the DCO application, including an assessment of how this may affect demand for water in the area.

6.6.12 As the Cable Route Corridor will be installed below ground with no permanent above ground structures required, there is no potential for the Cable Route Corridor to impact the water environment once construction is complete.

6.6.13 The proposed solar panels will be held above ground level, typically on narrow diameter piled legs (<100mm diameter). As a result, ground cover beneath the solar panels will remain substantially the same as existing. In order to limit the potential for rainfall running off the edge of solar panels to increase flood risk

within the Scheme Boundary or elsewhere, the area beneath the solar panels will be planted with native grassland and wildflower mix to intercept and absorb rainfall. Effects of the Scheme on flood risk during operation are therefore anticipated to be **not significant**.

Decommissioning Effects

- 6.6.14 The potential impacts on the water environment during decommissioning of the Scheme will be similar to those during construction. Mitigation measures will be included in a DEMP to prevent pollution and flooding during this phase. Effects on the water environment during decommissioning are therefore anticipated to be **not significant**.

Mitigation and Monitoring

- 6.6.15 The CEMP will set out mitigation measures that are based on industry guidance to manage construction works such that watercourses are not affected. This will include details of water quality monitoring to be undertaken during construction. Due to the low level of risk posed by the construction works, this monitoring will consist of visual and odour checks, plus testing of water using hand-held water quality meters.
- 6.6.16 During the operation of the Scheme, there will be regular inspection and maintenance of the drainage systems and watercourse crossings. This will be carried out in accordance with good practice guidance. The drainage system will be designed in accordance with current guidance to ensure that the potential for siltation and blockages is minimised under normal operation. Measures required during operation of the Scheme will be included in a Framework Operational Environmental Management Plan (OEMP), a draft of which will be submitted with the DCO application.

6.7 Human Health

Introduction

- 6.7.1 **PEI Report Volume I Chapter 11: Human Health** presents the findings of an assessment of the likely significant effects of the Scheme on the health of surrounding communities.

Baseline

- 6.7.2 Existing health conditions have been established by drawing on nationally recognised data and research including (but not limited to) Census 2011, Office for National Statistics employment data, and statistics released by the Department for Education and National Health Service.
- 6.7.3 The Scheme has the potential to impact human health during construction, operation and decommissioning, due to impacts on the following health determinants:
- Community connectivity including access to services, facilities (including open space) and employment;
 - Prioritisation of travel by walking and cycling;
 - Road and route safety;

- Employment and income;
- Air quality;
- Noise and vibration;
- Climate change; and
- Climate change resilience.

Assessment of Effects

Construction Effects

6.7.4 Overall, due to the temporary nature of the construction phase, the effect of the Scheme on the above health indicators is assessed as being **not significant**.

Operational Effects

6.7.5 Once the Scheme is operational, it will enable the generation of renewable energy and help the UK reach its target for net zero by 2050. The effect of this on human health is considered to be beneficial and **significant**.

6.7.6 Aside from this, as the Scheme will not restrict access to community facilities and will have low requirements for maintenance and traffic, the effect of the Scheme on all other health indicators is therefore assessed as being **not significant**.

Decommissioning Effects

6.7.7 As with the construction phase, due to the temporary nature of the decommissioning phase, the effect of the Scheme on the above health indicators is assessed as being **not significant**.

Mitigation and Monitoring

6.7.8 With regards to the impacts during the construction phase on human health, the Construction Environmental Management Plan would include a range of industry standard good practice construction phase measures required during all works.

6.7.9 During operation, there are no requirements for any monitoring of significant effects.

6.8 Landscape and Visual Amenity

Introduction

6.8.1 **PEI Report Volume I Chapter 12: Landscape and Visual Amenity** presents the findings of an assessment of the likely significant effects of the Scheme on landscape and visual receptors.

6.8.2 In this assessment, 'landscape receptors' includes consideration of local and published landscape or townscape character areas. Landscape effects relate to changes to the landscape as a resource, including physical changes to the fabric or individual elements of the landscape, its aesthetic or perceptual qualities, and landscape character. This relates to both rural landscapes and urban landscapes.

- 6.8.3 Visual receptors relate to 'people' and their existing views. Visual effects relate to the potential for there to be changes to the composition of existing views, from the addition or loss of elements within the view.
- 6.8.4 The assessment considers impacts during construction, operation and decommissioning of the Scheme. It has been conducted in line with guidance in the Guidelines for Landscape and Visual Impact Assessment 3 (GLVIA3) (Ref. 5).

Baseline

- 6.8.5 The Principal Site is located on agricultural land. The land is generally flat and low-lying, but the Lincoln Cliff (or Edge) to the east of the Scheme Boundary is a prominent local feature and contrasts with the low-lying farmlands. Expansive views are available from the crest (top of the scarp) of the Lincoln Cliff.
- 6.8.6 The Principal Site largely comprises fields that are medium to large scale and rectangular in shape. The fields are generally bounded by hedges, occasionally with trees but many are cut low and sometimes have sections missing. Hedgerows closer to the edges of villages and along some roads or tracks are often wider and taller, with more numerous trees. Woodland is relatively sparse.
- 6.8.7 For the visual assessment, 13 sensitive visual receptors have been identified as being representative of visual effects as a result of the Principal Site. These viewpoints (VPs) are listed below and shown in Figure 5:
- VP1: Access track to Harpswell Grange, off A631;
 - VP2a: Common Lane, east of Hermitage Low Farm (looking east);
 - VP2b: Common Lane, east of Hermitage Low Farm (looking west);
 - VP3: Local Green Space, Harpswell Hall Farm;
 - VP4: B1398 Middle Street, above Harpswell;
 - VP5: Kexby Road, west of Glentworth;
 - VP6: Bridleway (Gltw/85/1) south of Glentworth;
 - VP7: B1398 Middle Street, Glentworth Cliff Farm;
 - VP8: B1398 Middle Street, above Fillingham;
 - VP9: Kexby Road, west of Glentworth Grange: junction with bridleway Gltw/85/1;
 - VP10: Kirton Gate Lane (by-way);
 - VP11: Kell's Barn, Sturgate;
 - VP12: School Lane, Springthorpe; and
 - VP13: Public footpath (Hems/787/82), Millfield, Hemswell.
- 6.8.8 For the Cable Route Corridor, as the design of this is still being progressed, no VPs have been identified. This will be considered in the ES that will be submitted with the DCO application.

Assessment of Effects

Construction Effects

- 6.8.9 For landscape effects, the largest effects during construction will arise within areas of the Principal Site where solar panels will be installed. Such effects will arise from direct, physical changes to the landscape and perceptual influences related to construction, including the progressive installation of panels across the site. Construction will not result in the loss of valued landscape features, but the scale and intensity is such that the effect during construction would be **significant**.
- 6.8.10 Landscape effects when perceived from areas surrounding the Principal Site will predominately be less, due to the level of screening from vegetation, particularly mature trees and dense, tall hedgerows. However, construction may be visible from the Lincoln Cliff due to its elevated position in the landscape, therefore landscape effects when viewed from the Lincoln Cliff outside the Principal Site will be **significant**.
- 6.8.11 Landscape effects relating to the Cable Route Corridor will be limited, because construction of the Cable Route Corridor will be more limited in extent and duration. Landscape effects as a result of the Cable Route Corridor would therefore be **not significant**.
- 6.8.12 In terms of visual impacts during construction of the Principal Site, based on site surveys, up to around fifteen residential receptors adjacent to the Principal Site; up to eight residential receptors on Middle Street; and surrounding rural roads that are used for walking/cycling but have limited screening vegetation may experience visual effects considered to be **significant**.
- 6.8.13 In terms of visual impacts during construction of the Cable Route Corridor, depending on the amount of vegetation clearance required, residential receptors on Cottam Road and Floss Lane in Cottam may experience visual effects considered to be **significant**.
- 6.8.14 However, these significant effects may be reduced by factors such as new boundary planting and will be refined further assessment and production of photomontages⁸ as part of the ES that will accompany the DCO application.

Operational Effects

- 6.8.15 For landscape effects, the largest effects will again arise within areas of the Principal Site due to the installation of solar panels and associated infrastructure that will lead to a direct change in land use. The effects of this at both Year 1 and Year 15 of the Scheme's operation are considered to be **significant**.
- 6.8.16 However, landscape effects when perceived from areas surrounding the Principal Site will be less. Once new planting has grown, it is anticipated that the landscape effects when viewed from outside the Principal Site at Year 15 of the Scheme's operation will be **not significant**.
- 6.8.17 In terms of visual impacts, the most affected receptors at Year 1 of the Scheme's operation will be similar to those affected most by construction. However, once new planting has grown, this will reduce the visual impacts

⁸ Photomontages are a computer generated visualisation that superimposes of an image of what the Scheme is anticipated to look like onto present day photography.

experience at Year 15 of the Scheme's operation. The effects from the below viewpoints at Year 15 may still be considered **significant**.

- Viewpoint 7 (B1398 Middle Street, Glentworth Cliff Farm): moderate adverse
- Viewpoint 9 (Kexby Road, west of Glentworth Grange): moderate adverse
- Viewpoint 10 (Public footpath, Millfield, Hemswell): major adverse

6.8.18 This includes up to eight residential receptors on Middle Street that may receive significant visual impacts at Year 15, due to the presence of the Principal Site within wide-ranging, panoramic views from Lincoln Cliff and the limited influence of screening when viewed at this elevation. However, these effects and their significance will be reviewed following site surveys and production of photomontages.

6.8.19 In terms of visual impacts along the Cable Route Corridor, at Year 1, depending on the amount of vegetation clearance required around residential receptors on Cottam Road and Floss Lane in Cottam, visual effects may be considered **significant**. However, at Year 15, new planting will return views to broadly what they are currently, therefore visual effects will be **not significant**.

Decommissioning Effects

6.8.20 Activities relating to decommissioning are likely to be similar to construction for the Principal Site as a worst-case scenario. However, as decommissioning of the Scheme will take place after new planting that was installed during construction has matured (and this planting will predominantly remain in situ), it is anticipated that landscape and visual effects during decommissioning will be **not significant**.

Mitigation and Monitoring

6.8.21 Further iterations of the landscape design will be undertaken before the submission of the DCO application, including understanding vegetation clearance requirements further so that options for reinstatement and/or additional planting can be implemented wherever possible.

6.9 Noise and Vibration

Introduction

6.9.1 **PEI Report Volume I: Chapter 13: Noise and Vibration** presents the findings of an assessment of the likely significant effects of the Scheme on noise and vibration. The assessment considers the impacts during construction, operation and decommissioning of the Scheme.

Baseline and Context

6.9.2 A baseline noise monitoring survey was completed around the Principal Site in July 2022 (see Figure 4). This monitoring indicated that road traffic noise was the dominant noise source at most locations. Where monitoring locations were not located close to roads, the dominant noise source was wind, bird song, farming activity or aircraft using Sturgate Airfield.

Assessment of Effects

Construction Effects

- 6.9.3 Mitigation measures documented within a Construction Environment Management Plan would include practical measures to reduce noise and vibration from construction works, such as switching off plant when not in use, regular maintenance of plant and undertaking noisy activity such as unloading in a considerate way to minimise noise generation. In addition, residents near to the Scheme Boundary would be kept updated of upcoming construction works, including when any particularly noisy activities would be undertaken.
- 6.9.4 Construction noise and vibration predictions have been undertaken and all daytime predictions are below thresholds where disturbance would be caused. Where works associated with the Cable Route Corridor are required in close proximity to residential properties, there may be potential for adverse effects if drilling to cross Stow Park Road and the Cottam Power Station railway line have to be completed overnight. If this was required, this would likely only happen over a few nights and would be agreed in advance with the relevant local authority (including details on the construction method, noise mitigation and communication strategy with local residents). Effects of construction noise and vibration are therefore considered to be **not significant**.
- 6.9.5 The potential additional road traffic noise generated by construction vehicles has been predicted using a high-level calculation and is anticipated to be **not significant**, however, further modelling will be completed once detailed construction traffic data is available and will be reported in the ES that is submitted with the DCO application.

Operational Effects

- 6.9.6 The Principal Site will include plant such as inverters, transformers, switchgear and the BESS that will generate noise when the Scheme is operational. The exact products have not been selected yet, therefore conservative assumptions on sound power levels from these equipment have been used to predict the potential noise that may be generated.
- 6.9.7 It is likely that operational noise from plant will comprise a continuous or steady hum, rather than noticeable impulsive or intermittent sounds. Operational noise calculations have been completed and noise may be noticeable at some residential properties, based on the worst case assumptions made in the assessment, however, these are at levels that would be **not significant**.
- 6.9.8 As the Cable Route Corridor will be installed below ground with no permanent above ground structures required, there is no potential for the Cable Route Corridor to generate operational noise or vibration.

Decommissioning Effects

- 6.9.9 It is assumed that the noise and vibration effects during decommissioning will be similar the construction phase. Therefore, the standard mitigation measures included in the Construction Environment Management Plan to mitigate noise and vibration impacts will be appropriate for the decommissioning phase too and the effects are anticipated to be **not significant**.
- 6.9.10 Likewise, it is assumed that construction traffic numbers during decommissioning will be similar to the construction phase. Decommissioning

is expected to be shorter in duration, less intensive and with fewer road trips. Therefore, effects are considered to be no worse than during the construction phase and are anticipated to be **not significant**.

Mitigation and Monitoring

- 6.9.11 A construction noise monitoring scheme shall be developed as per requirements of the Construction Environment Management Plan following appointment of a contractor and prior to commencement of construction works. It is not anticipated that additional mitigation or monitoring is needed during operation or decommissioning. While the locations of sub-stations and control rooms may change following detailed design work, the Applicant will be required to ensure that any environmental impacts (including noise) are no worse than those that were stated in the Environmental Statement submitted with the DCO application.

6.10 Socio-Economics and Land Use

Introduction

- 6.10.1 **PEI Report Volume I Chapter 14: Socio-Economics and Land Use** presents the findings of an assessment of the likely significant effects on socio-economics and land use as a result of the Scheme.

Baseline

- 6.10.2 The Scheme has been assessed against the existing socio-economic conditions at the site and the surrounding area and, where relevant, the local context within West Lindsey and Bassetlaw. Existing socio-economic conditions have been established by drawing on nationally recognised data and research including (but not limited to) Census 2011, Office for National Statistics employment data, and statistics released by the Department for Education and National Health Service.
- 6.10.3 There is one Public Right of Way (PRoW) located within the Principal Site: an approximately 500m stretch of Gltw/85/1, which is an extension of Fill/85/1, Fill/85/2 and Fill/767/1. These PRoWs connect Willingham Road to Kexby Road.
- 6.10.4 Surveys have been completed to understand the quality of soil within the Principal Site for farming. This is referred to as an Agricultural Land Classification (ALC) survey and soil is graded on a six-point scale, with Grade 1 the best quality and Grade 5 the worst quality for farming⁹. Soil within the Principal Site is mostly ALC Grade 3b, with some small pockets of ALC Grade 3a.

Assessment of Effects

Construction Effects

- 6.10.5 The construction period is expected to take 24 months, with construction of the Principal Site taking the full 24 months and construction of the Cable Route Corridor taking 6 months. It is estimated that the Scheme will require a peak

⁹ Grade 3 on the ALC scale is split into two sub-grades: Grade 3a and Grade 3b. Grades 1, 2 and 3a are considered 'best and most versatile (BMV) agricultural land, whereas Grades 3b, 4 and 5 are not considered BMV.

of 1,250 full-time equivalent (FTE) jobs, and an average of approximately 500 gross direct FTE jobs on-site over the 24 month construction period. It is anticipated that 15% of construction staff could be sourced from a 45 minute drive from the Scheme Boundary. Although this would provide a beneficial impact, it would be temporary during to the construction phase and is considered **not significant**.

- 6.10.6 The communities of Hemswell, Harpswell, Hemswell Cliff, Glentworth, Heapham and Springthorpe are located within 1km of the Principal Site Boundary. There are also a number of PRow close to the Scheme Boundary, including one PRow (an approximately 500m stretch of Gltw/85/1) within the Principal Site and a number of PRow that dissect the Cable Route Corridor. No temporary or permanent diversions to PRow are anticipated during construction of the Scheme. PRow Gltw/85/1 will continue to be accessible, with woodland screening measures proposed to mitigate against potential amenity impacts. It is anticipated that impacts to any PRow that the Cable Route Corridor will need to cross will be avoided by drilling the cable underneath the PRow. Effect on users of PRow are therefore considered to be **not significant**.
- 6.10.7 The Scheme will involve taking land from agriculture so that it can be used for solar panels. The Scheme has been located to take into account the quality of agricultural land, such as avoiding areas of ALC Grade 2 further to the east of the Scheme Boundary and having few areas of ALC Grade 3a within the Principal Site. As the loss of most agricultural land is reversible (following decommissioning), the effect of the Scheme on BMV agricultural land is considered to be **not significant**.
- 6.10.8 There are no residential properties, local businesses, open spaces, community facilities, visitor attractions or development land within the Principal Site. There is potential for noise, air quality, visual and traffic effects arising from construction of the Scheme to impact on the amenity of residents, businesses, users of open spaces within 500m of the Principal Site. The effects of this are assessed in other chapters of the Preliminary Environmental Information Report.

Operational Effects

- 6.10.9 The Scheme will generate an estimated 10-12 FTE long-term jobs during the operational phase. Although this would provide a beneficial impact, it is considered **not significant**.
- 6.10.10 The effects of the Scheme requiring land take of agricultural land for the lifetime of its operation have been assessed in the construction assessment. There are no new potential or additional impacts on agricultural land during the operation of the Scheme. The land use can be returned to farming after the Scheme is decommissioned and the land would be available for some forms of farming (such as sheep farming) during operation.

Decommissioning Effects

- 6.10.11 The estimated duration of the decommissioning period is expected to be 12-24 months. It is assumed based on the activities taking place that a similar number of jobs will be required for decommissioning as was needed for construction. Therefore, an average of between 521-544 gross FTE jobs are assumed to be needed on-site per day during this decommissioning period.

Although this would provide a beneficial impact, it would be temporary during to the decommissioning phase and is considered **not significant**.

6.10.12 The impacts on local communities and PRow during the decommissioning phase would be expected to be in line with the impacts assessed during the construction phase. These are therefore considered to be **not significant**.

6.10.13 An increase in soil organic matter content may occur during the lifetime of the Principal Site. The land will therefore be in the same or better condition than it currently is, as a result of the expected natural enhancement through approximately 40-60 years of being set aside. However, this is likely to be temporary and subject to good agricultural land management practices being adopted after decommissioning. Ground physical infrastructure will be removed and the Scheme Boundary returned to landowners in the condition as at the end of operation, including seeded and grassed land, and drainage systems reinstated if grass/drainage is disturbed during decommissioning works. The effect of the Scheme on BMV agricultural land is considered to be **not significant**

Mitigation and Monitoring

6.10.14 The Scheme has been designed to reduce effects such as noise, air quality and visual impacts as far as possible, which in turn will mitigate the effects on the local community and existing facilities from a socio-economics and land use perspective. No additional mitigation or monitoring is therefore required.

6.11 Transport and Access

Introduction

6.11.1 **PEI Report Volume I Chapter 15: Transport and Access** reports the findings of an assessment of the likely significant effects on traffic and transport as a result of the Scheme during construction and decommissioning.

Baseline and Context

6.11.2 The Scheme is located in a rural area with limited dedicated footways and pedestrian and cycle facilities in the area along the road network.

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

6.11.4 The two closest train stations to the Principal Site are located in Gainsborough, circa 10km to the west: Gainsborough Central Station and Gainsborough Lea Road Station. Approximately 10km to the west and south of the Cable Route Corridor are Retford Station and Saxilby Station.

6.11.5 The A631 is a key route that runs along the northern boundary of the Principal Site in an east-west direction. Three access points into the Principal Site are proposed along the A631. The road does not contain footways or street lighting provision within the vicinity of the Principal Site and is rural in character.

- 6.11.6 The B1398 Middle Street is a local route that runs along the eastern extent of the Principal Site. The A1500 (Till Bridge Lane) is located to the south of the Principal Site. The B1241 (Willingham Road) runs in a north-south direction along the western extent of the Principal Site through Normanby by Stow, Willingham by Stow, Kexby and Upton.

Assessment of Effects

Construction Effects

- 6.11.7 The forecast number of construction staff vehicles and HGVs has been calculated, including how this would be distributed across the existing local highway network. This analysis demonstrates that additional traffic movements to the Principal Site are within the overall capacity of the highway network. This increase has been assessed against the impact it could have on factors including the potential for accidents, causing delays to pedestrians and cyclists and affecting the level of public transport service. It is considered that all effects are **not significant**.
- 6.11.8 During construction, the Scheme would operate in accordance with a Construction Traffic Management Plan, which would define the routes that deliveries to site would need to take and a booking system so that deliveries avoid peak hours. Construction staff would also be encouraged to car share and travel by public transport, with the Scheme operating a pick-up service.

Operational Effects

- 6.11.9 Once the Scheme is operational, the Scheme is expected to generate a low level of vehicle trips for maintenance during the operational phase. As a reasonable worst-case, there will be 10-12 staff on-site daily, which as a worst-case scenario would generate up to 12 vehicles (24 movements) per day. In addition, there is forecast to be an average of 10 to 20 visits per year from four-wheel drive vehicles, HGVs or transit vans for maintenance. This equates to approximately one to two per month. Therefore, it was agreed in the EIA Scoping Opinion (**PEI Report Volume II Appendix 1-2**) that a detailed assessment of operational traffic was not required as this is considered to be **not significant**.

Decommissioning Effects

- 6.11.10 It is anticipated that decommissioning effects will be similar to, if not less than, the construction phase. It is considered that all effects during this phase are **not significant**.

Mitigation and Monitoring

- 6.11.11 No additional mitigation measures are proposed for the construction, operation or decommissioning phases following the embedded measures, given that there are not expected to be any significant effects as a result of the Scheme. These assumptions will be reviewed in the ES.

6.12 Other Environmental Topics

Introduction

- 6.12.1 This PEI Report briefly reports the assessments of environmental topics that are considered relevant to the Scheme, but where the environmental effects are clearly not significant and do not warrant a separate chapter.

Glint and Glare

- 6.12.2 A glint and glare assessment has been completed to understand the potential for solar panels to cause either momentary flashes of bright light (referred to as 'glint') or a continuous source of bright light (referred to as 'glare'). The full assessment is included in **PEI Report Volume II Appendix 16-1**.
- 6.12.3 Solar panels are designed to absorb, not reflect, sunlight. Studies generally agree that while there is potential for glint and glare from solar panels, which may cause a hazard or nuisance, the intensity of such reflections is similar to that caused by bodies of still water (which is considerably lower than for other man-made materials such as glass, steel or white concrete).
- 6.12.4 The assessment has concluded that there would be no impacts on residential or road receptors surrounding the Scheme Boundary. Eight aviation runways and two Air Control Towers were identified surrounding the Scheme Boundary. The only impacts were predicted for Runway 27 at Sturgate Airfield, but this is within limits that are considered acceptable according to aviation guidance.

Ground Conditions

- 6.12.5 A Preliminary Risk Assessment has been completed to review current and past land uses within and surrounding the Scheme Boundary to see whether there is potential for soil contamination to be present.
- 6.12.6 The potential sources of contamination identified are considered to be acceptable. If the DCO for the Scheme is granted, then soil samples will be collected and tested to understand the chemical properties of the soil, which will inform any health and safety measures required when handling the material.

Major Accidents and Disasters

- 6.12.7 Accidents are an occurrence resulting from uncontrolled developments in the course of construction, operation and decommissioning (e.g. a major emission, fire or explosion). "Disasters" are naturally occurring extreme weather events or ground related hazard events (e.g. subsidence, landslide, earthquake).
- 6.12.8 An exercise was undertaken to identify all possible major accidents or disasters that could be relevant to the Scheme.
- 6.12.9 By their very nature, major accidents and disasters have the potential to lead to moderate or major adverse significant effects, and therefore the focus is on prevention and response planning to reduce the risk or effect of this happening. This is on-going through design development and consultation with relevant statutory consultees.

6.12.10 However, at this stage, it is not expected that there is a significant risk of major accidents and disasters during construction, operation or decommissioning of the Scheme. The potential for Scheme to affect flood risk is covered in **PEI Report Volume II Appendix 10-2** and for battery storage to result in a fire is covered in **PEI Report Volume II Appendix 3-3**.

Telecommunications, Television Reception and Utilities

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

6.12.12 The potential exists for utilities to be affected during the construction and decommissioning of the Scheme through damage caused as a result of excavation and engineering operations. Further information is being sought from utility providers about infrastructure that may be present within the Scheme Boundary.

Waste

6.12.13 Given the nature of the Scheme, significant quantities of waste are not anticipated.

6.12.14 A Construction Resources Management Plan (CRMP) and a CEMP will be prepared for the construction phase (as well as a DEMP for the decommissioning phase). These will include measures to control and manage waste on-site.

6.13 Effect Interactions

6.13.1 This potential for effect interactions and cumulative effects to occur as a result of the Scheme has been assessed. Effect interactions and cumulative effects are defined as:

- **Effect Interactions:** The combined effect of several different impacts from a single development, which may collectively result in a new or different likely environmental effect of greater significance on a single receptor. Individually the effects resulting from these impacts may not be significant, but the accumulation of effects may collectively cause an overall significant effect. An example could be if the same receptor is subjected to noise, dust, and visual impacts associated with site works during construction; and
- **Cumulative Effects:** Where the environmental effects of a single development act together with those of other planned projects and developments within close enough proximity to the Scheme to lead to cumulative effects on the same receptor.

6.13.2 This assessment of potential effect interactions and cumulative effects has been based on information available at the time of preparing the PEI Report. The assessment will be finalised in the ES that will be submitted with the Development Consent Order (DCO) application, when the environmental effects of the Scheme and the cumulative developments have been confirmed.

Conclusions in this assessment are therefore preliminary and subject to change.

6.14 Cumulative Effects

Introduction

- 6.14.1 This potential for cumulative effects to occur as a result of the Scheme has been assessed as far as possible with information currently available.
- 6.14.2 Cumulative effects are defined as where the environmental effects of a single development act together with those of other planned projects and developments within close enough proximity to the Scheme to lead to cumulative effects on the same receptor.

Assessment of Effects

Construction Effects

- 6.14.3 This assessment of cumulative effects has been based on information available at the time of preparing the PEI Report. Further detail about the design of the Scheme and further assessment is required to understand the potential for there to be significant cumulative effects on nearby landscape and visual receptors, heritage assets around the Scheme Boundary and ecological receptors such as skylarks.
- 6.14.4 Aside from this, no other significant cumulative effects have been identified, since it is assumed all other developments would implement their own construction phase environmental mitigation, such that effects are not significant. In addition, if there is overlap during the construction phases of other solar schemes planned in the area, then transport effects may be managed jointly, with solar developers prepared a joint Construction Traffic Management Plan (CTMP) to co-ordinating deliveries to each site and avoid rush hours.

Operational Effects

- 6.14.5 This assessment of cumulative effects has been based on information available at the time of preparing the PEI Report. Further detail about the design of the Scheme and further assessment is required to understand the potential for there to be significant cumulative effects on nearby landscape and visual receptors, heritage assets around the Scheme Boundary and ecological receptors such as skylarks.
- 6.14.6 Aside from this, no other significant cumulative effects have been identified, since it is the operational effects associated with other topics are generally limited to the construction phase. In terms of ecology, it is anticipated that each of the other solar schemes planned in the area would deliver 10% biodiversity net gain, which may have potential to generate a cumulative significant effect. This will be reviewed further in the ES that is submitted with the DCO application.

Decommissioning Effects

- 6.14.7 As the Scheme has an estimated design life of 40-60 years, it is not possible to predict what developments would be being constructed or decommissioned at the same time as the Scheme is being decommissioned. Broadly, however,

the effects of decommissioning are likely to be similar to those during construction. Mitigation measures for managing environmental impacts during decommissioning would be documented within the Framework DEMP and it assumed that any nearby construction/decommissioning sites would manage their ecological impacts to a similar level of good practice in accordance with their own CEMPs/DEMPs. Therefore, it is not predicted at this stage that there would be any significant cumulative environmental effects, but this will be explored further in the ES.

7. Summary and Conclusions

- 7.1.1 The Preliminary Environmental Information Report explains the interim findings of the environmental assessments that has been undertaken for the Scheme as part of the EIA.
- 7.1.2 A number of measures have been identified to avoid or mitigate environmental impacts. It is proposed that these will be secured through appropriate requirements and other controls within the DCO for the Scheme, should this be granted.
- 7.1.3 Feedback from the formal consultation process will be taken into account when preparing the ES that will be submitted with the DCO application.

8. Figures

Figure 1: Scheme Boundary



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LEGEND
 Scheme Boundary

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PEI Report
PROJECT NUMBER
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FIGURE TITLE
Scheme Boundary

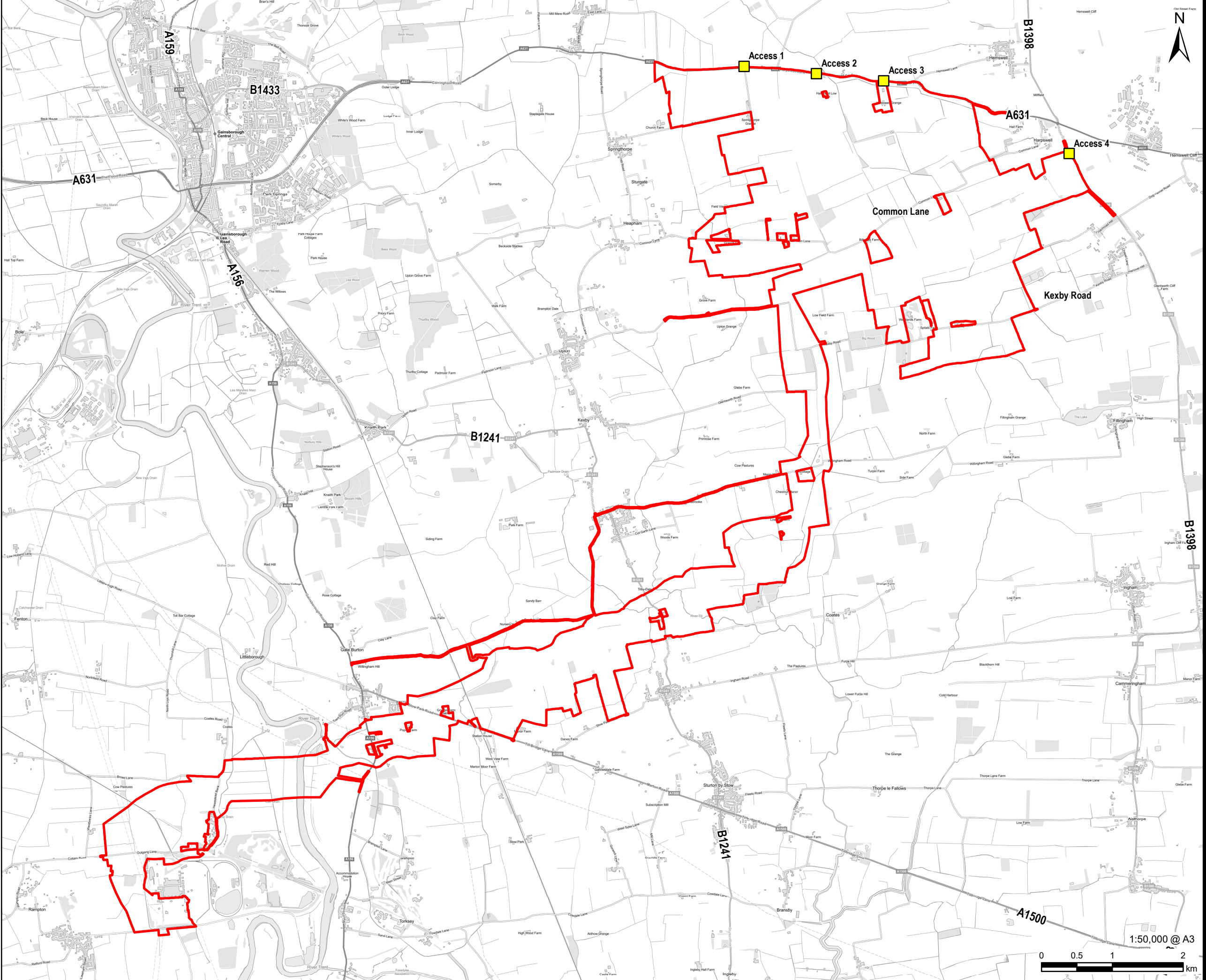
FIGURE NUMBER
Figure 1



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Figure 2: Locations of Proposed Accesses for the Principal Site

Revision: 0 Drawn: LL Checked: OR Approved: ST Date: 2023-03-22
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LEGEND
[Red outline] Scheme Boundary
[Yellow square] Potential Site Accesses for the Principal Site

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FIGURE TITLE
Proposed Access Plan - Principal Site

FIGURE NUMBER
Figure 2

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Figure 3: Indicative Site Layout Plan

— PRINCIPAL SITE BOUNDARY

EXISTING FEATURES AND CONSTRAINTS

EXISTING WOODLAND WITHIN AND AROUND SITE

EXISTING HEDGEROWS (INDICATIVE) WITHIN AND AROUND SITE

PUBLIC RIGHT OF WAY

TEMPORARY VOLUNTARY BRIDLEWAY (SPRINGTHORPE)

EXISTING FEATURES AND CONSTRAINTS

FLOOD ZONE 2 EXTENTS

FLOOD ZONE 3 EXTENTS

GRADE I LISTED BUILDINGS

GRADE II LISTED BUILDINGS

SCHEDULED MONUMENTS

CONSERVATION AREA

AREA OF GREAT LANDSCAPE VALUE: (CENTRAL LINCOLNSHIRE LOCAL PLAN)

INDICATIVE PROPOSED SCHEME

AREAS OF SOLAR PANELS WITH PROPOSED SEMI-IMPROVED GRASSLAND BENEATH

SOLAR STATIONS AND BESS

MAINTENANCE ACCESS TRACKS

PROPOSED SUBSTATION SITES

PROPOSED WATER TANK SITES

ADDITIONAL ELEMENTS E.G. SITE OFFICES, STORAGE

MAIN SITE ACCESS LOCATIONS

CONSTRUCTION COMPOUNDS

POTENTIAL AREAS FOR WOODLAND (PRIMARILY AS SCREENING)

POTENTIAL AREAS FOR ECOLOGICAL ENHANCEMENT (E.G. GRASSLAND FOR GROUND NESTING BIRDS, OR SPECIES-RICH MEADOWS)

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

COTTAM SOLAR SCHEME: APPLICATION BOUNDARY

PROJECT MANAGEMENT INITIALS

DESIGNED: NA CHECKED: NA APPROVED: ST

INTERNAL PROJECT NUMBER SCALE

60677969 1:25,000

STATUS BS1192 SUITABILITY

SHEET TITLE

INDICATIVE SITE MASTERPLAN

DRAWING NUMBER REV

FIGURE 3



New and enhanced hedgerows along A631: scope to allow to grow taller as screening and for wildlife value

Site access 1

Woodland belts to limit views from the A631 and create new wildlife corridors

Site access 3

Potential for enhanced planting to provide increased screening along eastern boundary near Harpswell

Scheme set back from Hall Farm (including Scheduled Monument) and open space/permissive paths

Screening along ridge to limit views from Harpswell

Narrow band of planting along Middle Street to provide continuous wildlife corridor and limit views nearest to the

Solar infrastructure set back from Lincoln Cliff

Woodland as screening and new habitat area north of Northlands Road

Woodland as screening to limit views from properties along Kexby Road, with additional set-back of grassland habitats to help mitigate loss of longer-range views

Buffer to proposed Cottam solar scheme: scope for new habitats, including damp grasslands within flood zone

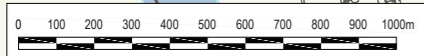
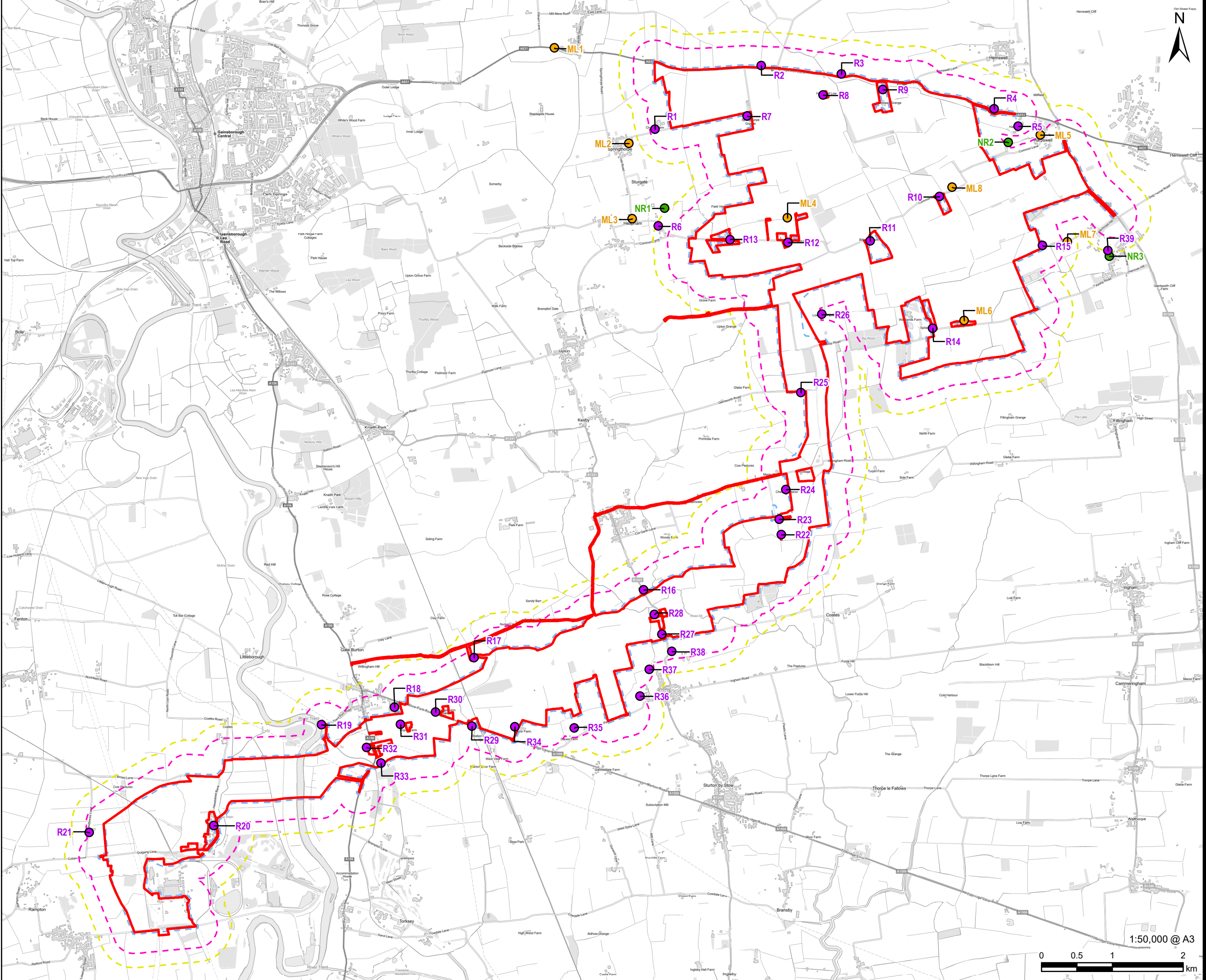


Figure 4: Noise Sensitive Receptors and Noise Monitoring Survey Locations



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- LEGEND**
- Scheme Boundary
 - Residential Receptor
 - Non-Residential Receptor
 - Noise Monitoring Location
 - 30m Buffer - For Vibration Study Area
 - 300m Buffer - For Construction Noise Study Area
 - 500m Buffer - Operational Noise Study Area

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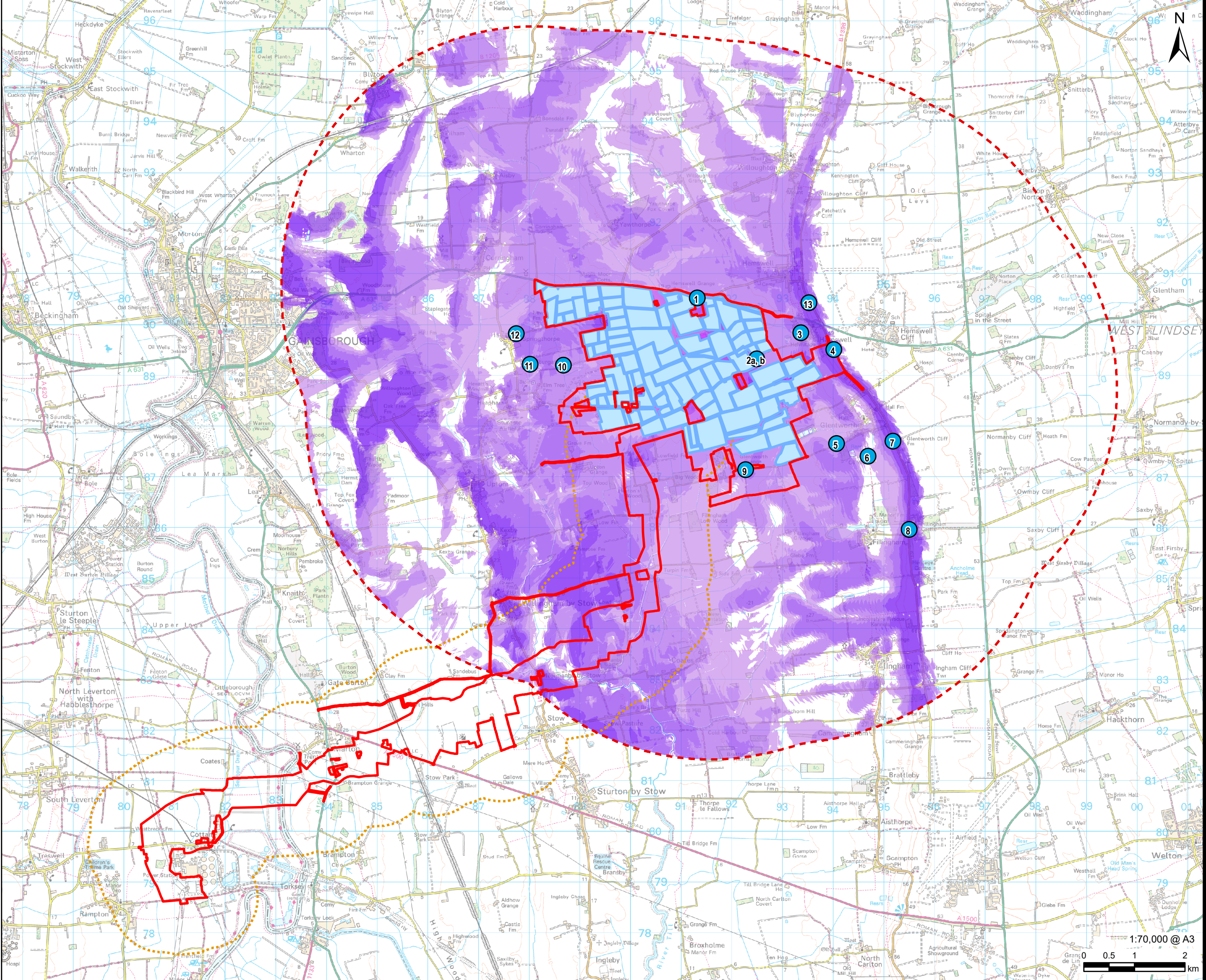
FIGURE TITLE
Noise Sensitive Receptors and Noise Monitoring Locations

FIGURE NUMBER
Figure 4



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Figure 5: Viewpoint Receptors



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- LEGEND**
- Scheme Boundary
 - Principal Site - 5km Buffer
 - Cable Route Corridor - 1km Buffer
 - Preliminary Representative LVIA Viewpoints: Principal Site Only
 - Indicative Solar Panel Boundary

- Zone of Theoretical Visibility - Degree of Maximum Visibility of the Solar Panels Area**
- Not Visible
 - 1 - 25%
 - 25 - 50%
 - 50 - 75%
 - 75 - 100%

NOTES

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1. The Zone of Theoretical Visibility (ZTV) is based upon points along the external boundary to the indicated solar panel area with an anticipated panel height of 3.5m and an observer height of 1.5m. It does not reflect all theoretical visibility arising from panels located within the external solar panel boundary.
2. The ZTV has been generated using Environment Agency Digital Terrain Model (DTM) with a 2m resolution.
3. The ZTV has been produced in order to inform 'on the ground' visual assessment and is based on a 'bare earth' model that does not include effects of screening derived from buildings or vegetation.
4. ZTV calculated using ArcGIS 10.8.1 Viewshed tool.
5. OS Open Data: © Crown copyright and database right 2019 Ordnance Survey (100021242).

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FIGURE TITLE
Preliminary Representative LVIA Viewpoints: Principal Site only (with Bare Earth ZTV)

FIGURE NUMBER
Figure 5 - Viewpoint Receptors

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9. References

- Ref. 1 HMSO (2008). The Planning Act 2008.
- Ref. 2 HMSO (2017). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017.
- Ref. 3 HMSO (2019). The Climate Change Act 2008 (2050 Target Amendment) Order 2019
- Ref. 4 HMSO (2021). The Environment Act 2021.
- Ref. 5 Landscape Institute and IEMA (2013). Guidelines for Landscape and Visual Impact Assessment (GLVIA3). *Third Edition*.

