FENWICK SOLAR FARM

Preliminary Environmental Information Report

Volume I Chapter 5: Environmental Impact Assessment Methodology

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Prepared for: Fenwick Solar Project Limited

Prepared by: AECOM Limited

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5. Environmental Impact Assessment Methodology

5.1 Introduction

5.1.1 This chapter sets out the process and methodology followed in the preparation of this Preliminary Environmental Information Report (PEIR).

EIA Process

- 5.1.2 Environmental Impact Assessment (EIA) is the process undertaken to identify and evaluate the likely significant effects of a proposed development on the environment and to identify measures to mitigate or manage any significant negative effects. An EIA should be informed by consultation with statutory consultees, other interested bodies and members of the public. 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 development proposal.
- 5.1.3 This PEIR provides details of the environmental information available at the point in time that it has been produced and aims to inform the Scheme's statutory consultation process.
- 5.1.4 Following statutory consultation and taking into account comments received, this PEIR will be updated to generate an Environmental Statement (ES) which will accompany the Development Consent Order (DCO) Application for the Scheme. The ES will follow a similar systematic approach to EIA and project design as presented in this PEIR. The process of identifying environmental effects is both iterative and cyclical, running in tandem with the Scheme's iterative design process.
- 5.1.5 The key elements in EIA for a Nationally Significant Infrastructure Project (NSIP) such as the Scheme are:
 - Iterative project design, taking feedback from consultation and applying it to the development design process on an ongoing basis throughout the EIA process;
 - b. Scoping and ongoing consultation, including consideration of responses and how these should be addressed as part of the EIA;
 - Technical environmental impact assessments, including baseline studies, input to the design process, and identification of potential significant environmental effects;
 - d. Consultation on the PEIR; and
 - e. Preparation and submission of the ES. Mitigation to be proposed where available and appropriate to reduce or prevent likely significant adverse effects.

- 5.1.6 Each of the technical assessments follows a systematic approach with the principal steps being:
 - a. Description of baseline conditions;
 - b. Identification of appropriate embedded mitigation measures, including design changes;
 - c. Assessment of likely significant effects;
 - d. Identification of appropriate additional mitigation and enhancement measures where likely significant effects are identified;
 - e. Assessment of residual (likely) environmental effects that remain following application of additional mitigation and enhancement measures; and
 - f. Assessment of cumulative effects when considering the Scheme along with the potential effects of other planned developments in the area.
- 5.1.7 The assessments provided in this PEIR are preliminary and the design of the Scheme is evolving as assessments continue. However, the PEIR provides the public and consultation bodies with an informed view of the likely significant environmental effects of the Scheme. The conclusions in this PEIR will be updated following statutory consultation, continued assessment work, and consideration of consultation feedback as the design of the Scheme evolves. When those conclusions are finalised, the significance of the effects identified in this PEIR may be revised such that adverse effects decrease in significance (but the intention is that they do not increase in significance).

Assessment Approach

- 5.1.8 This PEIR been prepared to identify and evaluate the likely significant effects of the Scheme on the environment and to identify measures to mitigate or manage any significant negative effects. In turn this will help to ensure decision makers are able to make an informed judgement on the environmental impacts of the Scheme. Additionally, care has been taken to ensure that the PEIR satisfies the requirements of The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (hereafter referred to as the EIA Regulations) (Ref. 5-1).
- 5.1.9 In preparing this PEIR, reference has been made to the following guidance:
 - a. Planning Inspectorate Advice Note 2: The Role of Local Authorities in the Development Consent Process (Ref. 5-2);
 - b. Planning Inspectorate Advice Note 3: EIA Consultation and Notification (Ref. 5-3);
 - c. Planning Inspectorate Advice Note 7: Environmental Impact Assessment: Process: Preliminary Environmental Information, Screening and Scoping (Ref. 5-4);
 - d. Planning Inspectorate Advice Note 9: Using the Rochdale Envelope (Ref. 5-5);
 - e. Planning Inspectorate Advice Note 10: Habitats Regulations Assessment relevant to Nationally Significant Infrastructure Projects (Ref. 5-6);

- f. Planning Inspectorate Advice Note 11: Working with Public Bodies in the Infrastructure Planning Process (Ref. 5-7);
- g. Planning Inspectorate Advice Note 17: Cumulative Effects Assessment relevant to nationally significant infrastructure projects (Ref. 5-8);
- h. Planning Inspectorate Advice Note 18: The Water Framework Directive (Ref. 5-9); and
- i. European Commission (1999) Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (Ref. 5-10).

EIA Scoping

- 5.1.10 The aim of the scoping process is to identify key expected environmental issues at an early stage, determine which elements of the Scheme are likely to result in significant effects on the environment, and establish the extent of survey and assessment requirements for the EIA.
- 5.1.11 The issues to be addressed within this PEIR and the future ES were identified in the EIA Scoping Report submitted to the Planning Inspectorate on 1 June 2023 (PEIR Volume III Appendix 1-1: EIA Scoping Report). The Planning Inspectorate reviewed and consulted on the EIA Scoping Report and adopted (on behalf of the Secretary of State) a Scoping Opinion on 11 July 2023. The Scoping Opinion included the formal responses received by the Planning Inspectorate from statutory consultees (PEIR Volume III Appendix 1-2: EIA Scoping Opinion).
- 5.1.12 Key issues raised in the Scoping Opinion are summarised and have been responded to in **PEIR Volume III Appendix 1-3: EIA Scoping Opinion Responses**. All issues raised in the Scoping Opinion are being considered during the EIA process.
- 5.1.13 In response to the Scoping Opinion, this PEIR, and in due course the ES, will include assessments for the following environmental topics:
 - a. PEIR Volume I Chapter 6: Climate Change;
 - b. PEIR Volume I Chapter 7: Cultural Heritage;
 - c. PEIR Volume I Chapter 8: Ecology;
 - d. PEIR Volume I Chapter 9: Water Environment;
 - e. PEIR Volume I Chapter 10: Landscape and Visual Amenity;
 - f. PEIR Volume I Chapter 11: Noise and Vibration:
 - g. PEIR Volume I Chapter 12: Socio-economics and Land Use; and
 - h. PEIR Volume I Chapter 13: Transport and Access.
- 5.1.14 The EIA Scoping Report (PEIR Volume III Appendix 1-1: EIA Scoping Report) concluded that several technical topics did not require a full chapter within the PEIR and ES, and this proportional approach was accepted by the Planning Inspectorate in their Scoping Opinion (PEIR Volume III Appendix 1-2: EIA Scoping Opinion). These topics are not scoped out; rather, the assessment undertaken is presented within a single chapter. The assessment of these topics follows the methodology set out in Section 5 of the EIA Scoping Report (PEIR Volume III Appendix 1-1: EIA Scoping

Report) providing detail on baseline conditions, methodology used, potential impacts and mitigations, and where significant effects are likely to occur. These topics and information on potential impacts and effects are described in:

- a. **PEIR Volume I Chapter 14: Other Environmental Topics**. This includes:
 - i. Air Quality;
 - ii. Glint and Glare;
 - iii. Ground Conditions;
 - iv. Major Accidents and Disasters;
 - v. Telecommunications and Utilities:
 - vi. Electromagnetic Fields (EMF); and
 - vii. Materials and Waste.
- 5.1.15 As described in the EIA Scoping Report (PEIR Volume III Appendix 1-1: EIA Scoping Report) and accepted in the EIA Scoping Opinion (PEIR Volume III Appendix 1-2: EIA Scoping Opinion), potential effects to human health are considered in the PEIR technical chapters with a standalone assessment scoped out of the EIA. For clarity, potential effects to human health are set out in the following technical assessments:
 - a. **PEIR Volume I Chapter 9: Water Environment**, Section 9.8 Preliminary Assessment of Likely Significant Effects;
 - b. **PEIR Volume I Chapter 10: Landscape and Visual Amenity**, Section 10.8 Preliminary Assessment of Likely Significant Effects;
 - c. **PEIR Volume I Chapter 11: Noise and Vibration**, Section 11.8 Preliminary Assessment of Likely Significant Effects;
 - d. **PEIR Volume I Chapter 13: Transport and Access**, Section 13.8 Preliminary Assessment of Likely Significant Effects;
 - e. PEIR Volume I Chapter 14: Other Environmental Topics, Air Quality, Section 14.2;
 - f. PEIR Volume I Chapter 14: Other Environmental Topics, Ground Conditions, Section 14.4, PEIR Volume III Appendix 14-3: Preliminary Risk Assessment Solar PV Site and Appendix 14-4 Preliminary Risk Assessment Grid Connection Corridor:
 - g. PEIR Volume I Chapter 14: Other Environmental Topics, Major Accidents and Disasters, Section 14.5;
 - h. PEIR Volume I Chapter 14: Other Environmental Topics, Electromagnetic Fields, Section 14.7; and
 - i. PEIR Volume I Chapter 15: Cumulative Effects and Interactions, Section 15.5.
- 5.1.16 Paragraph 4 within Schedule 4 (information for inclusion in environmental statements) of the EIA Regulations (Ref. 5-1) states that an ES should include a "description of the factors [...] likely to be significantly affected by the development: population, human health, biodiversity (for example fauna

and flora), land (for example land take), soil (for example organic matter, erosion, compaction, sealing), water (for example hydromorphological changes, quantity and quality), air, climate (for example greenhouse gas emissions, impacts relevant to adaptation), material assets, cultural heritage, including architectural and archaeological aspects, and landscape". These factors are addressed within the relevant chapters listed above.

Preliminary Environmental Information Report

- 5.1.17 This PEIR summarises the outcomes to date of the following ongoing EIA activities:
 - a. Establishing baseline conditions;
 - b. Consultation with statutory and non-statutory consultees;
 - c. Consideration of relevant local, regional and national planning policies, guidelines, and legislation relevant to the EIA;
 - d. Consideration of technical standards for the development of effect significance criteria and specialist assessment methodologies;
 - e. Design review;
 - f. Review of secondary information, previous environmental studies, publicly available information and databases;
 - g. Physical surveys and monitoring;
 - h. Desk-top studies;
 - Modelling and calculations, where the design is suitably well developed and/or sufficient data are available; and
 - i. Reference to current guidance.
- 5.1.18 For ease of reference, each technical chapter herein follows the same structure as outlined in Table 5-1, where practicable. Notable exceptions are the topic areas considered in PEIR Volume I Chapter 14: Other Environmental Topics.

Table 5-1: Sections within each technical chapter in the PEIR and their function

Section heading	Function of section
Introduction	Outlines the content of the chapter. Identifies chapters which should be read in conjunction, along with supporting PEIR figures and appendices.
Study Area	Refers to the Study Area which is relevant to the assessment within the technical chapter.
Legislation, Policy and Guidance	Refers to any legislation, policy and guidance which is relevant to the specific assessment within the technical chapter and the likely significant effects of the Scheme. This section refers to topic-specific appendices that provide more information on the relevant legislation, policy and guidance.

Section heading	Function of sect	ion
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Scoping Opinion and Additional Consultation	Refers to PEIR Volume III Appendix 1-3: EIA Scoping Opinion Responses which provides a full review of all comments raised in the Scoping Opinion and outlines how and where the Scoping Opinion comments have been addressed within this PEIR or will be addressed within the ES. Any additional consultation including that which is proposed or previously undertaken is included.
Assessment Methodology	Describes the assessment methodology used for the chapter in accordance with the latest and applicable technical guidance and consultant expertise.
Assumptions, Limitations and Uncertainties	Outlines assumptions, limitations and uncertainties regarding the information contained in the chapter. For example, this might include information available at the time of writing.
Baseline Conditions	Describes the baseline characteristics of the Site and relevant Study Area (i.e. pre-existing conditions) prior to the Scheme in regard to the specific chapter.
Embedded Mitigation	Outlines any mitigation measures which have been identified and implemented as part of the design of the Scheme relevant to the specific chapter. This is based on predicted impacts, through iterative assessment with the aim to reduce or prevent potential adverse impacts from the outset.
Preliminary Assessment of Likely Impacts and Effects	Provides a summary of the likely effects during construction, operation and maintenance, and decommissioning of the Scheme, taking account of the embedded mitigation measures.
Additional Mitigation and Enhancement Measures	Outlines any additional mitigation measures which may be required based on the outcome of the preliminary assessment. These measures are only required if significant effects are identified. These additional mitigations may include measures beyond industry standard controls such as bespoke/site specific measures. Alternatively, an explanation is provided if no additional mitigation or enhancement measures are proposed.
Residual Effects	Provides a summary of the remaining likely effects during construction, operation and maintenance, and decommissioning of the Scheme, taking account of the embedded mitigation and additional mitigation and enhancement measures, where applicable.

Section heading	Function of section		
Cumulative Effects	Presents a preliminary assessment of the potential for cumulative effects between the Scheme and other proposed and committed plans and developments.		
Summary and Conclusions	Describes the main findings of the chapter and any subsequent steps that follow the preliminary assessment. This may include measures such as additional engagement with consultees or details of additional survey work.		
References	Provides a list of sources of information referred to throughout the specific chapter.		

5.1.19 Where there are specific requirements for technical assessments, additional headings may be added to improve clarity of reporting.

5.2 Rochdale Envelope

- As discussed in **PEIR Volume I Chapter 2: The Scheme**, not all technical parameters have been determined for the Scheme at this stage and will not be until after the granting of the DCO. This is important as the technology for solar Photovoltaic (PV) and Battery Energy Storage Systems (BESS) continues to evolve. Therefore, maintaining flexibility to meet the changing demands of the UK market prior to Scheme construction enables the Applicant to adopt the most up to date technology at the point of commencement of development. The 'Rochdale Envelope' approach has been applied within the PEIR to ensure a robust assessment of the likely significant environmental effects of the Scheme, in accordance with the Planning Inspectorate's Advice Note 9: Using the Rochdale Envelope (Planning Inspectorate, 2018) (Ref. 5-5). This involves assessing the maximum parameters.
- 5.2.2 Additionally, paragraph 4.3.18 of NPS EN-1 (2023) (Ref. 5-11) provides that "the Secretary of State should consider the worst case impacts in its consideration of the application and consent, providing some flexibility in the consent to account for uncertainties in specific project details".
- 5.2.3 Therefore, as is relevant for each technical discipline, the maximum (and where relevant, minimum) parameters for the elements where flexibility needs to be retained have been assessed under the Rochdale Envelope approach. The approach also recognises that the worst-case parameter for one technical assessment may differ from another, ensuring that worst case overall impacts are predicted. Each technical chapter (PEIR Volume I Chapters 6 to 14) describes the parameters applied in relation to the particular discipline. As the Scheme design evolves, key elements of the design may be fixed. However, flexibility will need to be maintained for some aspects of the Scheme for the DCO Application. Where flexibility is to be

retained in the application, any changes to design parameters after consent will need to remain within the likely worst-case envelope.

5.3 Spatial Scope

5.3.1 The technical chapters (**PEIR Volume I Chapters 6 to 14**) describe the spatial scope, including the rationale for determining the specific area within which the assessment is focussed. The Study Areas are a function of the nature of the impacts and the locations of potentially affected environmental resources or receptors. Justification for the spatial scope considered appropriate is documented in each technical chapter (**PEIR Volume I Chapters 6 to 14**) with figure(s) for each Study Area presented in **PEIR Volume II** as appropriate.

5.4 Determining the Baseline Conditions

- 5.4.1 In order to predict the potential environmental effects of the Scheme, it is necessary to determine the environmental conditions that currently exist within the Site Boundary and the surrounding area, in the absence of the Scheme. These are known as 'baseline conditions'.
- 5.4.2 Detailed environmental baseline information is being collected the methodology for the data collection process will be detailed within the ES. Baseline information is being gathered from various sources, including:
 - a. Online/digital resources;
 - b. Data searches, for example EnviroCheck, Historic Environment Record, Doncaster Local Records Centre;
 - c. Baseline site surveys; and
 - d. Environmental information submitted in support of other planning applications for developments in the vicinity of the Scheme.
- 5.4.3 Where required, consideration is also being given to how the baseline conditions would evolve in the absence of the Scheme, known as the 'future baseline'. As described in **PEIR Volume I Chapter 3: Alternatives and Design Evolution**, this involves the consideration of the 'no development' or 'do nothing' scenario and, where required, allows impact assessments to consider and compare the scale of environmental changes, such as noise levels, with and without the Scheme at both the construction and operation and maintenance phases.

5.5 Development Design, Impact Avoidance and Mitigation

5.5.1 Regulation 14, paragraph (2)(c) of the EIA Regulations (Ref. 5-1) requires the ES to provide "a description of any features of the proposed development, or measures envisaged in order to avoid, prevent or reduce

- and, if possible, offset likely significant adverse effects on the environment". These are commonly referred to as mitigation measures.
- 5.5.2 The Scheme will adopt a standard hierarchical approach to identifying mitigation requirements:
 - Avoid or prevent: In the first instance, mitigation will seek to avoid or prevent the adverse effect at source, for example, by routeing the Grid Connection Corridor or siting the Solar PV Panels away from sensitive receptors;
 - Reduce: If the effect is unavoidable, mitigation measures will be implemented which seek to reduce the significance of the effect, for example, the use of a noise barriers to reduce construction noise at nearby noise sensitive receptors; and
 - c. **Offset**: If the effect can neither be avoided nor reduced, mitigation will seek to offset the effect through the implementation of compensatory mitigation, for example, habitat creation to replace any habitat losses.
- 5.5.3 Mitigation measures fall into two categories: 'embedded mitigation measures' (also referred to sometimes as 'in-built mitigation measures') which are integrated into the design of the Scheme, and 'additional mitigation measures' which are measures beyond industry standard controls.
- 5.5.4 The design process for the Scheme has been heavily influenced by the findings of early environmental appraisals and the EIA process with the Scheme incorporating measures into the design to avoid or minimise potential environmental impacts. The key aspects where the Scheme design has evolved are described in **PEIR Volume I Chapter 3: Alternatives and Design Evolution**. These elements of the design evolution include measures needed for legal compliance, as well as measures that implement the requirements of good practice guidance documents.
- 5.5.5 Once these measures are incorporated into the design, they are termed 'embedded measures'. Embedded measures relevant to the construction phase are described within each technical chapter (PEIR Volume I Chapters 6 to 14). For the operation and maintenance phase, such embedded measures will be represented primarily in the design, but are also described in the technical chapter (PEIR Volume I Chapters 6 to 14) where required/relevant. Embedded measures are therefore either incorporated into the design from the outset or identified through the assessment process.
- 5.5.6 The preliminary assessment presented in the PEIR has been undertaken on the basis that these embedded measures are incorporated in the Scheme design and construction practices. Embedded mitigation measures for the construction phase are set out in the PEIR Volume III Appendix 2-1: Framework Construction Environmental Management Plan (CEMP), including, but not limited to, measures such as construction and exclusion zones in relation to retained vegetation, ensuring a tidy and neat working area, and the sustainable management and handling of soil resources in accordance with good practice measures. The Framework Construction

- Environmental Management Plan (CEMP) will be further updated and submitted with the ES as part of the DCO Application.
- 5.5.7 The Framework CEMP will be developed into a detailed (or construction issue) CEMP by the appointed Contractor prior to the start of Scheme construction. The Framework CEMP provides a framework within which the appointed Contractor (including any sub-contractors or suppliers involved in the works) will plan, implement and deliver environmental management, mitigation and monitoring requirements (and implement any subsequent remedial actions required) during the Scheme construction phase. The detailed CEMP will be agreed with the local planning authorities following grant of the DCO and prior to the start of construction. Production of the detailed CEMP will be secured through a Requirement attached to the DCO. It is intended that the detailed CEMP will be a 'live' document and will be updated to reflect changes such as new legislation being issued or additional information becoming available.
- 5.5.8 Implementation of embedded mitigation relied upon in the assessment will be secured in the DCO, either through the setting of limits of deviation (e.g. development extents or specific maximum heights) or specifying mitigation measures via a Requirement attached to the DCO.
- 5.5.9 Where likely significant effects are identified as part of the assessment, consideration has been given to any 'additional mitigation' over and above the embedded mitigation that may be required to mitigate any significant adverse effects. These additional measures are presented within each of the technical chapters (PEIR Volume I Chapters 6 to 14), where required, and may include measures beyond industry standard controls such as bespoke/site specific measures like temporary fencing to prevent glint and glare until the vegetation planting has properly established, or monitoring measures which may trigger additional remedial action to be implemented. These measures will be discussed within the relevant framework environmental management plans. The residual effects (after the implementation of mitigation) have then been assessed and are presented in each technical chapter. Significant residual effects are also summarised in PEIR Volume I Chapter 16: Summary of Environmental Effects.

5.6 Temporal Scope

5.6.1 This section sets out the temporal scope and assessment years used for each phase of the assessment.

Construction Phase Effects

5.6.2 For the purposes of the assessment, the construction phase effects are those effects that result from activities during enabling works, construction and commissioning activities. This covers sources of impacts such as construction traffic, noise and vibration from construction activities, dust generation, site runoff, mud on roads, risk of fuel/oil spillage, and the visual intrusion of plant and machinery on-site. Some aspects of construction related impacts will last for longer than others, for example, impacts related to the establishment of construction compounds are likely to be relatively short in duration in respect of the whole construction phase, whereas the construction of energy infrastructure and landscaping activities are likely to

persist throughout the entire construction phase and beyond. By their nature, most construction impacts will be temporary and reversible.

Operation and Maintenance Phase Effects

- 5.6.3 Operational effects are the effects that are associated with operation and maintenance activities during the generating lifetime of the Scheme. This includes the effects of the physical presence of the Solar PV Infrastructure, and its operation and maintenance. Timescales associated with these enduring effects fall into the following categories (unless otherwise specified within a technical chapter):
 - a. Short term endures for up to 12 months after construction or decommissioning;
 - Medium term endures for one to five years after construction or decommissioning;
 - Long term endures for more than five years after construction or decommissioning;
 - d. Reversible long-term effects long-term effects, which endure throughout the lifetime of the Scheme but which cease once the Scheme has been decommissioned (in relation to the Scheme, operation and maintenance effects will all fall into this category); and
 - e. Permanent effects effects which cannot be reversed following decommissioning (e.g. should buried archaeology be permanently removed during construction).
- 5.6.4 Environmental management and mitigation measures for the operation and maintenance phase of the Scheme will be planned, implemented and delivered through an Operational Environmental Management Plan (OEMP). A Framework OEMP will be prepared as part of the DCO Application and secured through a Requirement in the DCO. The Framework OEMP will be developed into a detailed OEMP following the grant of the DCO.

Decommissioning Phase Effects

- 5.6.5 The design life of the Scheme is 40 years with decommissioning to commence 40 years after final commissioning (currently anticipated to be 2030 to 2070). The technical assessments presented in this PEIR (**PEIR Volume I Chapters 6 to 14**) therefore assume a design/operational life of 40 years.
- 5.6.6 For the assessment, decommissioning phase effects will be taken to be those for which the source begins and ends during the decommissioning phase, and the effects do not endure beyond the completion of the decommissioning phase. For example, this covers sources of impacts such as decommissioning traffic, noise and vibration from decommissioning activities, dust generation, site runoff, mud on roads, risk of fuel/oil spillage, and the visual intrusion of plant and machinery on-site. Typically, decommissioning phase impacts will be similar in nature to those experienced during the construction phase, although they may be of shorter

duration and of slightly less intensity. As with construction phase effects, some aspects of decommissioning will endure for longer than others.

Assessment Years

- 5.6.7 The assessment considers the environmental impacts of the Scheme at key stages in its construction, operation and maintenance, and decommissioning, as far as practicable.
- 5.6.8 The 'existing baseline' date is 2023/2024, since this is the period in which the baseline studies for the EIA have been undertaken. Where relevant, 'Future baseline' conditions are also identified for each assessment scenario, whereby the conditions anticipated to prevail at a certain point in the future (assuming the Scheme does not progress in the interim) are identified for comparison with the predicted conditions with the Scheme. This can include the introduction of new receptors and resources into an area or new development schemes that have the potential to change the baseline.
- 5.6.9 The Applicant is in discussions with National Grid to bring forward the grid connection date and ensure that the renewable energy generated by the Scheme will be available to the National Grid as soon as possible, helping to meet net zero targets and contributing towards security of supply. Subject to being granted consent and following a final investment decision, the earliest construction could start is in 2028. Construction of the Grid Connection Cables is anticipated to require 12 months, whereas construction of the Solar PV Site will require an estimated 24 months, with operation therefore anticipated to commence in 2030, with decommissioning no later than 40 years after final commissioning.
- 5.6.10 The assessment scenarios that are being considered for the purposes of the EIA (and considered in this PEIR) are as follows:
 - a. Existing Baseline (2023/2024) this is the principal baseline against which environmental effects will be assessed.
 - b. Future Baseline (No Development) in 2028–2030, which are the expected Scheme construction years. A future baseline scenario in 2043 is also included for landscape, visual and heritage setting only, reflecting Year 15 (post construction), in accordance with industry good practice. Where relevant, consideration will also be given to a future baseline approximately 40 years after commencement of operation (2070) to assess potential Scheme decommissioning impacts. These assessment years are explained in Paragraphs 5.6.11 to 5.6.12.
 - c. Construction (2028–2030) (With Development) the peak construction year for the purpose of the EIA is anticipated to be 2029. This assumes commencement of construction in 2028 and that the Scheme (including the installation of the Grid Connection Cables) is built out over a 24-month period. This is a likely worst case from a traffic generation point of view because it compresses the trip numbers into a shorter duration and represents the greatest impact on the highway network. A lengthened construction phase would spread out the trip numbers over a longer duration, likely resulting in lower traffic, and consequently lower air quality and noise impacts and, therefore, the likely worst-case scenario has been assessed within the PEIR. Where a compressed construction

phase does not represent the worst case for some topics, this is discussed in the relevant technical chapter to ensure that actual or worst-case effects scenarios for those topics have been determined. The peak construction assessment year will be reviewed as the anticipated construction programme is considered in more detail during design development. A full justification for the reasonable worst-case scenario that is assessed will be provided in the ES.

- d. Decommissioning (after an estimated 40 years from final commissioning, approximately 2070) this would be the earliest year that decommissioning would commence based on the anticipated 40 year design life of the Scheme.
- 5.6.11 The proposed operational assessment year for the purpose of the EIA is 2030. This is expected to be the earliest date that the Scheme can be fully built out and operational.
- 5.6.12 A future year of 2043 is also considered for some specific topics including landscape and visual amenity, to take account of the maturation of vegetation (i.e. 15 years after the operational assessment year). This is a requirement of the Landscape Institute guidelines (Ref. 5-12), which are discussed further in **PEIR Volume I Chapter 10: Landscape and Visual Amenity**. Other topics such as socio-economics and land use present data for alternative future years as per their assessment methodologies.
- 5.6.13 The decommissioning assessment year for the purpose of the EIA is approximately 2070, based on the design life of the Scheme.

5.7 Significance Effect Criteria

- 5.7.1 The evaluation of the significance of an effect is important as it is the significance that determines the resources that should be deployed in avoiding or mitigating a significant adverse effect, or conversely, the actual value of a beneficial effect. The overall environmental acceptability of the Scheme is a matter for the Secretary of State to determine, having considered, amongst other matters, the environmental information that is set out in the ES, including all likely beneficial and adverse environmental effects. Where it has not been possible to quantify effects, qualitative assessments will be undertaken, based on available knowledge and professional judgment. Where uncertainty exists, this will be noted in the relevant technical chapter and valid assumptions made/a worst case approach taken as appropriate.
- 5.7.2 The significance of residual effects will be determined by reference to criteria for each assessment topic. Specific effect significance criteria for each technical discipline will be developed, giving due regard to the following:
 - a. Extent and magnitude of the impact (i.e. the magnitude of change from the baseline condition) (described as high, medium, low and very low);
 - b. Effect duration (see Paragraph 5.6.3) and whether effects are temporary, reversible or permanent;
 - c. Effect nature (whether direct or indirect, reversible or irreversible, beneficial or adverse);

- d. Whether the effect occurs in isolation, is cumulative or interacts with other effects:
- e. Performance against any relevant environmental quality standards;
- Sensitivity of the receptor (described as high, medium, low and very low); and
- g. Compatibility with environmental policies.
- 5.7.3 The significance of residual effects will be evaluated with reference to available definitive standards, accepted criteria and legislation, where applicable. For issues where definitive quality standards do not exist, significance will be based on the:
 - Local, district, regional or national scale or value of the resource affected;
 - b. Number of receptors affected;
 - c. Sensitivity of these receptors; and
 - d. Duration of the effect.
- 5.7.4 In order to provide a consistent approach to expressing the outcomes of the various studies undertaken as part of the EIA and thereby enable comparison between effects upon different environmental topics, the following terminology is used in the PEIR to define residual effects:
 - a. Adverse detrimental or negative effects to an environmental/socioeconomic resource or receptor;
 - a. Negligible (also referred to as 'neutral' for some topics) imperceptible effects to an environmental/socio-economic resource or receptor;
 - b. No effect where there would be no effects upon the environmental/socio-economic resource or receptor; or
 - c. Beneficial advantageous or positive effects to an environmental/socioeconomic resource or receptor.
- 5.7.5 Where adverse or beneficial effects are identified, these will be assessed against the following scale:
 - Negligible effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error and are of no significant consequence;
 - b. Minor slight, very short or highly localised effect of no significant consequence;
 - c. Moderate noticeable effect (by extent, duration or magnitude) which may be considered significant; or
 - d. Major considerable effect (by extent, duration or magnitude) of more than local significance or in breach of recognised acceptability, legislation, policy or standards; considered significant.
- 5.7.6 Each of the technical chapters (**PEIR Volume I Chapters 6 to 14**) provide the criteria, including sources and justifications, for quantifying the different categories of effect. Where practicable, this will be based upon quantitative and accepted criteria (for example, noise assessment guidelines), together

- with the use of value judgment and expert interpretation to establish to what extent an effect is environmentally significant.
- Table 5-2 illustrates an example of the classification of effects matrix which 5.7.7 takes into account the receptor sensitivity (or value) and the magnitude of impact experienced.

Table 5-2: Example matrix to classify the significance of environmental effects

Sensitivity or value	Magnitude of impact			
of resource/receptor	High	Medium	Low	Very low
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Negligible	Negligible
Very low	Minor	Negligible	Negligible	Negligible

Following the classification of an effect, clear statements will be made within 5.7.8 the technical chapters (PEIR Volume I Chapters 6 to 14) as to whether that effect is significant or not significant. As a rule, major and moderate effects are considered to be significant (as shown by the shaded cells in Table 5-2), whilst minor and negligible effects are considered to be not significant. However, professional judgement will be applied, including taking account of whether the effect is permanent or temporary, its duration and frequency, whether it is reversible, and/or its likelihood of occurrence. Generic definitions for the classification of effects are shown in Table 5-3.

Table 5-3: Generic effect descriptions

Effect	Generic description
Major	These effects may represent key factors in the decision-making process. Potentially associated with sites and features of national importance or likely to be important considerations at a regional or district scale. Major effects may relate to resources or features which are unique and which, if lost, cannot be replaced or relocated.
Moderate	These effects are likely to be important at a local scale and on their own could have an important and relevant influence on decision making.
Minor	These effects may be raised as local issues and may be of relevance in the detailed design of the project but are unlikely to be critical in the decision-making process.
Negligible	Effects which are beneath levels of perception, within normal bounds of variation or within the margin of forecasting error.

Effect Generic description

These effects are unlikely to influence decision making, irrespective of other effects.

- 5.7.9 Where mitigation measures are identified to eliminate, mitigate, or reduce adverse impacts, these have either been incorporated into the design of the Scheme, translated into construction commitments, or included as operational or managerial standards/procedures. The technical chapters (PEIR Volume I Chapters 6 to 14) in this PEIR present any 'residual' effects, which are the effects which remain following the implementation of embedded and additional mitigation measures and classify these in accordance with the effect classification terminology given above.
- 5.7.10 It should be noted that some technical disciplines may utilise different criteria when undertaking assessments due to differences in industry accepted guidelines and specifications. Where this is the case, the technical topic will discuss how the assessment methodology or classification of effects differs for the general EIA methodology as described in this section and provide justification.

Assessment of Construction and Decommissioning Effects

- 5.7.11 The assessment of construction and decommissioning effects will be undertaken based on existing knowledge, techniques and equipment. A 'reasonable worst-case' scenario will be used with respect to the envisaged construction methods, location (proximity to sensitive receptors), phasing and timing of construction activities. Typically, decommissioning phase effects are similar in nature to those experienced during the construction phase, although they may be of shorter duration and of slightly less intensity.
- 5.7.12 The assessment of construction and decommissioning effects assume the implementation of standard good practice measures, for example, the use of dust suppression measures on haul roads and using containers with 110 % capacity to store fuel and other chemicals onsite. The purpose of this is to focus on the Scheme-specific effects, rather than generic construction effects that can be easily addressed using generic good practice mitigation measures which the Applicant has committed to. Construction and decommissioning assumptions, including what has been assumed in terms of good practice measures, are set out within the technical chapters (PEIR Volume I Chapters 6 to 14) of the PEIR and the Framework CEMP (PEIR Volume III Appendix 2-1: Framework Construction Environmental Management Plan (CEMP), noting that the Framework CEMP will be updated and submitted with the DCO Application). Each technical chapter (PEIR Volume I Chapters 6 to 14) of the PEIR identifies and assesses construction and decommissioning effects that are likely to remain after these mitigation measures are in place.

5.8 Interaction and Accumulation

5.8.1 In accordance with the Schedule 4, paragraph 5 of the EIA Regulations (Ref. 5-1) a preliminary assessment of 'cumulative effects' has been considered in the PEIR. By definition, these are effects that result from incremental

- changes caused by other past, present, or reasonably foreseeable actions cumulatively with the Scheme.
- 5.8.2 For the cumulative impact assessment presented in the PEIR, two types of effect are considered:
 - a. The combined effect of individual impacts from the Scheme, for example, where a single receptor is affected by noise and traffic disruption during the construction of the Scheme (these are referred to as 'effect interactions'); and
 - b. The combined effects of other development schemes which may interact cumulatively with the Scheme. The effects of these schemes may be insignificant on an individual basis, but cumulatively with the Scheme have a new or different likely significant effect (these are referred to as 'cumulative effects').
- 5.8.3 The assessment is based on the best available data from other proposed and committed developments and associated information which is currently in the public domain or has been provided to the Scheme. The assessment assumes that publicly available information is accurate; the assessment is also reliant on collaboration with a range of statutory consultees, neighbouring authorities and other developers to identify changes in information which may be pertinent to the assessment.
- 5.8.4 Where there are specific limitations associated with data, these are highlighted.
- 5.8.5 PEIR Volume II Figure 15-3: Location of Short List Schemes illustrates the location of other developments (cumulative developments) in the local area that have the potential to increase the impacts associated with the Scheme. An initial long list (PEIR Volume III Appendix 15-1: Initial Long List of Other Developments) and the short list of cumulative developments has been prepared and shared with City of Doncaster Council, North Yorkshire Council and East Riding of Yorkshire Council for agreement in preparing this PEIR. Table 15-3 in PEIR Volume I Chapter 15: Cumulative Effects and Interactions presents the list of relevant cumulative developments considered in the assessment.
- 5.8.6 Each of the topic chapters of this PEIR (**PEIR Volume I Chapters 6 to 14**) contains a preliminary assessment of relevant cumulative effects.

Effect Interactions

- 5.8.7 A range of public sector and industry-led guidance is available on the approach to assessing and quantifying effect interactions that lead to combined effects on sensitive receptors, but at present there is no single, agreed industry standard method. The European Commission (EC) has produced guidelines for assessing effect interactions which "are not intended to be formal or prescriptive but are designed to assist EIA practitioners in developing an approach which is appropriate to a project [...]" (Ref. 5-10).
- 5.8.8 AECOM has reviewed these guidelines and has developed an approach based upon professional judgement which uses the defined residual effects of the Scheme to determine the potential for effect interactions to lead to combined effects. This approach was followed on Sunnica Energy Farm,

- Gate Burton Energy Park and Longfield Solar Farm, which are all solar NSIPs and have either been accepted for examination or granted a DCO.
- 5.8.9 The EIA predicts beneficial and adverse effects during construction, operation and maintenance, and decommissioning of the Scheme which are classified as being minor, moderate or major. Several effects on one receptor or receptor group could theoretically interact or combine to produce an combined significant overall effect.
- 5.8.10 An exercise which tabulates the Scheme effects on receptors or receptor groups has been undertaken to determine the potential for effect interactions and therefore any combined effects (Table 15-1 and Table 15-2 in PEIR Volume I Chapter 15: Cumulative Effects and Interactions). Only adverse or beneficial residual effects classified as minor, moderate, or major have been considered in relation to potential effect interactions. Residual effects classified as negligible are excluded from the assessment of the effect interactions as, by virtue of their definition (see Table 5-3), are considered to be imperceptible effects to an environmental/socio-economic resource or receptor which would not have the potential to lead to effect interactions.

Cumulative Effects with Other Developments

5.8.11 The Planning Inspectorate's Advice Note 17 (Ref. 5-8) on the assessment of cumulative effects identifies a four-stage approach. Adopting that approach, as appropriate, the Applicant's methodology for the assessment of cumulative effects is as follows.

Stage 1 – Establish the NSIP's Zone of Influence and Identify Long List of 'Other Development'

- 5.8.12 A review of other developments has been undertaken, initially encompassing a Zol defined by the technical topic specialists in order to prepare a long list of 'other development'. The justification for each Zol identified is presented in PEIR Volume I Chapters 6 to 14 and summarised in Table 15-1 of PEIR Volume I Chapter 15: Cumulative Effects and Interactions. Agreement with the relevant statutory consultation bodies has been sought where practicable and summarised in the consultation section of each technical chapter (PEIR Volume I Chapters 6 to 14).
- 5.8.13 The long list of cumulative developments (PEIR Volume III Appendix 15-1: Initial Long List of Other Developments) has been shared with the relevant Local Planning Authorities for comment, i.e. City of Doncaster Council, North Yorkshire Council and East Riding of Yorkshire Council. The list was issued to each of the authorities on 24 October 2023, with a request for each authority to review the list and advise whether there are any additional schemes that they consider should be included. No request to consider any additional schemes has been received from any of the authorities up to the time of writing. The Applicant will continue to engage with the Local Authorities who will be provided with an opportunity to review and comment on any updates to the long list at the ES Stage. The long list in the ES will take account of any requests from the Local Authorities for additional 'other developments' to be considered; any comments on the long list or additional 'other developments' identified during statutory consultation; and any new developments or allocations identified following statutory

- consultation and prior to the start of preparing the ES for DCO Application submission.
- 5.8.14 Developments included in the initial long list have been identified using the following criteria. The criteria have been developed having regard to Planning Inspectorate Advice Note 17 (Ref. 5-8) and utilising experience of assessing cumulative effects for schemes of a similar nature and scale to the Scheme:
 - a. Development currently under construction that would have previously met one of (d) to (g);
 - b. Approved applications which have not yet been implemented (covering the past five years and taking account of those that received planning consent over three years ago and are still valid but have not yet been implemented), and meet one of (d) to (g);
 - c. Submitted applications not yet determined meeting one of (d) to (g);
 - d. Development listed on the National Infrastructure Planning Programme of Projects within 5 km of the Site Boundary;
 - e. Other applications for EIA development within 5 km of the Site Boundary including applications for EIA screening and scoping opinions;
 - f. Development allocations identified in the relevant Development Plan (and emerging Development Plans) within 5 km of the Site Boundary; and
 - g. Other, non-EIA applications for solar development, excluding householder or small-scale roof mounted solar developments, within 5 km of the Site Boundary.

Stage 2 – Identify Shortlist of 'Other Development' for Cumulative Effects Assessment

- 5.8.15 At Stage 2, any developments of a nature or scale without the potential to result in likely significant cumulative effects were excluded, following consideration of the likely ZoI for each environmental topic. The long list of cumulative developments has informed the shortlist presented in Table 15-2 of PEIR Volume I Chapter 15: Cumulative Effects and Interactions and the shortlist of developments discussed within each technical chapter of this ES, which for each technical discipline is topic specific, and based on their own methodology and justification.
- 5.8.16 The shortlist of cumulative developments presented **PEIR Volume I Chapter 15: Cumulative Effects and Interactions** has been based on:
 - a. The scale of the other developments;
 - The developments that fall within the Zol of specialists topics (PEIR Volume II Figure 15-1: Zol Extents for Assessment of Potential Cumulative Effects); and
 - c. If there is the potential for any temporal overlap between the Scheme and other developments.
- 5.8.17 The shortlist of cumulative developments (Table 15-2 of **PEIR Volume I Chapter 15: Cumulative Effects and Interactions**) was shared with the

City of Doncaster Council, North Yorkshire Council and East Riding of Yorkshire Council for comment on 24 October 2023 along with the long list. No request to consider any additional schemes has been received from any of the authorities up to the time of writing. The short list will continue to be reviewed and updated if required at ES stage based upon any comments received.

Stage 3 – Information Gathering

- 5.8.18 To inform the assessment, information relating to the other developments has been collected from appropriate sources (which may include the Local Planning Authorities, the Planning Inspectorate or directly from the applicant/developer) and include, but are not limited to:
 - a. Proposed design and location information;
 - b. Proposed programme of demolition, construction, operation and maintenance, and/or decommissioning; and
 - c. Environmental assessments that set out baseline data and effects arising from 'other developments'.

Stage 4 – Assessment

- 5.8.19 The preliminary assessment of cumulative effects is contained within the topic chapters (PEIR Volume I Chapters 6 to 14) and a summary is presented in PEIR Volume I Chapter 15: Cumulative Effects and Interactions which includes a list of developments considered to have the potential to generate a cumulative effect together with the Scheme. These are presented in Table 15-4 of PEIR Volume I Chapter 15: Cumulative Effects and Interactions which includes a brief description of the development and a reason for selection.
- 5.8.20 The criteria for determining the significance of any cumulative effect is based upon:
 - a. The duration of effect i.e. will it be temporary or permanent;
 - b. The extent of effect e.g. the geographical area of an effect;
 - c. The type of effect e.g. whether additive or synergistic;
 - d. The frequency of the effect;
 - e. The 'value' and resilience of the receptor affected; and
 - f. The likely success of mitigation.
- 5.8.21 In reporting the overall significance of cumulative effects, it is appropriate to also acknowledge the relative contributions different projects make to a cumulative effect, and carefully consider whether the cumulative effect is significant. For example, where a large-scale project is predicted to result in significant effects in its own right and a smaller proposed development would not have significant effects, the cumulative assessment should only conclude that there is a significant cumulative effect if the effect of both projects together is of greater significance than the larger project in isolation. Consequently, care has been taken not to simply propagate such effects as

being cumulative, but rather to focus on the nature and scale to which genuine cumulative effects might result.

5.8.22 Preliminary information on the likely significant cumulative effects is provided in this PEIR.

5.9 References

- Ref. 5-1 His Majesty's Stationery Office (HMSO) (2011). The Infrastructure Planning (Environmental Impact Assessment) Regulations 2017 (as amended by The Town and Country Planning and Infrastructure Planning (Environmental Impact Assessment) (Amendment) Regulations 2018). Available at: https://www.legislation.gov.uk/uksi/2018/695/contents/made and https://www.legislation.gov.uk/uksi/2018/695/contents/made [Accessed 27 July 2023].
- Ref. 5-2 Planning Inspectorate (2015). Advice Note 2: The Role of Local Authorities in the Development Consent Process. Available at:

 https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-two-the-role-of-local-authorities-in-the-development-consent-process/. [Accessed 27 July 2023].
- Ref. 5-3 Planning Inspectorate (2018). Advice Note 3: EIA Notification and Consultation. Planning Inspectorate (2020) Advice Note 7: EIA: Process, Preliminary Environmental Information, Screening and Scoping. Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-three-eia-notification-and-consultation-2/. [Accessed 27 July 2023].
- Ref. 5-4 Planning Inspectorate (2020). Advice Note 7: Environmental Impact Assessment: Process, Preliminary Environmental Information and Environmental Statements. Available at:

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- Ref. 5-6 Planning Inspectorate (2022). Advice Note 10 (Version 9): Habitats Regulations Assessment relevant to Nationally Significant Infrastructure Projects Available at: https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-ten/. [Accessed 27 July 2023].
- Ref. 5-7 Planning Inspectorate (2017). Advice Note 11: Working with Public Bodies in the Infrastructure Planning Process. Available at:

 https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-note-eleven-working-with-public-bodies-in-the-infrastructure-planning-process/. [Accessed 27 July 2023].
- Ref. 5-8 Planning Inspectorate (2019). Advice Note 17 (Version 2): Cumulative effects assessment relevant to nationally significant infrastructure projects. Available at: (main document)

- https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-17/. [Accessed 27 July 2023].
- Appendix 1 https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/an17 _appendix_1.pdf.
- Appendix 2 https://infrastructure.planninginspectorate.gov.uk/wp-content/uploads/2015/12/an17 _appendix_2.pdf.
- Ref. 5-9 Planning Inspectorate (2017). Advice Note 18: The Water Framework Directive. Available at:

 https://infrastructure.planninginspectorate.gov.uk/legislation-and-advice/advice-notes/advice-note-18/. [Accessed 27 July 2023].
- Ref. 5-10 European Commission (1999). Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions. Available at: https://ec.europa.eu/environment/archives/eia/eia-studies-and-reports/pdf/guidel.pdf. [Accessed 27 July 2023].
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